

GUAM'S REEFS AND BEACHES

PART II

SEDIMENTATION STUDIES AT

FOUHA BAY AND YLIG BAY

Richard H. Randall and Charles Birkeland

**COASTAL ZONE
INFORMATION CENTER**

CZIC COLLECTION

GC
399
R35
1978

UNIVERSITY OF GUAM MARINE LABORATORY

Technical Report No. 47

August 1978

This report was financed in part through a contract from the Bureau of Planning, Government of Guam. (500807709).

Cover photograph: Suspended sediment load tubes in site at a station in Fouha Bay.

13989

GUAM'S REEFS AND BEACHES

Part II

SEDIMENTATION STUDIES AT FOUHA BAY AND YLIG BAY

COASTAL ZONE
INFORMATION CENTER

By

Richard H. Randall and Charles Birkeland

CZIC COLLECTION

Submitted to

Bureau of Planning
Government of Guam

US Department of Commerce
NOAA Coastal Services Center Library
2234 South Hobson Avenue
Charleston, SC 29405-2418

University of Guam Marine Laboratory

Technical Report No. 47

August 1978

Guam University of Marine Laboratory
GC 397 R 35 1978

TABLE OF CONTENTS

	<u>Page</u>
LIST OF FIGURES	iii
LIST OF TABLES	v
INTRODUCTION	1
Background and Objectives	1
General Description of the Bays	3
Zonation Patterns	8
METHODS	9
Physical and Chemical Characteristics of the Water	9
Measurement of Suspended Sediment Load	9
Corals	10
RESULTS	13
Temperature, pH and Salinity	13
Nitrates and Phosphates	13
Suspended Sediment Load	28
Corals	32
DISCUSSION	75
REFERENCES CITED	77

LIST OF FIGURES

	<u>Page</u>
Figure 1. Map of Guam showing the study sites of Fouha and Ylig Bays	2
Figure 2. Fouha Bay showing locations of the sediment stations	4
Figure 3. Ylig Bay showing the location of the sediment stations	5
Figure 4. Vertical profiles of the channel margin, slope, and floor in the vicinity of the sediment stations at Fouha Bay	6
Figure 5. Vertical profiles of the channel margin, slope, and floor in the vicinity of the sediment stations of Ylig Bay	7
Figure 6. Bevelled and truncated apertures on a set of suspended sediment load trap tubes	11

LIST OF TABLES

	<u>Page</u>
Table 1. Temperature ($^{\circ}\text{C}$) of the water at ten stations at 3-month intervals in Fouha Bay	14
Table 2. Temperature ($^{\circ}\text{C}$) of the water of eight stations at 3-month intervals in Ylig Bay	15
Table 3. Water pH at ten stations at 3-month intervals in Fouha Bay	16
Table 4. Water pH at eight stations at 3-month intervals in Ylig Bay	17
Table 5. Water salinity ($^{\circ}/\text{oo}$) at ten stations at 3-month intervals in Fouha Bay	18
Table 6. Water salinity ($^{\circ}/\text{oo}$) at eight stations at 3-month intervals in Ylig Bay	19
Table 7. Phosphate levels in the water at ten stations at 3-month intervals in Fouha Bay	20
Table 8. Phosphate levels in the water at eight stations at 3-month intervals in Ylig Bay	21
Table 9. Nitrate levels in the water at ten stations at 3-month intervals in Fouha Bay	22
Table 10. Nitrate levels in the water at eight stations at 3-month intervals in Ylig Bay	23
Table 11. Phosphate levels in replicate samples at ten stations in Fouha Bay on 15 XII 1977	25
Table 12. Phosphate levels in replicate samples at eight stations in Ylig Bay on 1 II 1978	25

	<u>Page</u>
Table 13. Nitrate levels in replicate samples at ten stations in Fouha Bay on 8 II 1978	26
Table 14. Nitrate levels in replicate samples at eight stations in Ylig Bay on 1 II 1978	26
Table 15. Paired comparisons of station S-1 versus N-1, S-2 versus N-2, S-3 versus N-3 and S-4 versus N-4, in terms of nitrate and phosphate contents of the water with all comparisons made between samples taken on the same dates	27
Table 16. Dry weights of sediments collected in sediment trap tubes over 6-week periods in Fouha Bay	29
Table 17. Dry weights of sediments collected in sediment trap tubes over 6-week periods in Ylig Bay	30
Table 18. Analysis of sources of variation in suspended sediment load measurements in Fouha Bay	31
Table 19. Analysis of sources of variation in suspended sediment load measurements in Ylig Bay	31
Table 20. Average suspended sediment load measurements (gms dry weight) over 6-week periods at sampling stations in Fouha Bay and Ylig Bay from March 1977 through February 1978	31
Table 21. Species list of corals for Fouha and Ylig Bay Stations N-1 through N-4 and S-1 through S-4	33
Table 22. Coral frequency, density, and percent of substrate coverage at Fouha Bay sediment stations N-1 through N-4 and S-1 through S-4	40
Table 23. Coral frequency, density, and percent of substrate coverage at Ylig Bay sediment stations N-1 through N-4 and S-1 through S-4	46

	<u>Page</u>
Table 24. Size distribution of corals at Fouha Bay Stations N-1 through N-4 and S-1 through S-4	51
Table 25. Size distribution of coral species at Ylig Bay Stations N-1 through N-4 and S-1 through S-4	61
Table 26. Frequency distribution of coral colony diameters at Fouha Bay stations N-1 through N-4 and S-1 through S-4	71
Table 27. Frequency distribution of coral colony diameters at Ylig Bay Stations N-1 through N-4 and S-1 through S-4	72
Table 28. Frequency distribution of coral colony growth forms at Fouha Bay Stations N-1 through N-4 and S-1 through S-4	73
Table 29. Frequency distribution of coral colony growth forms at Fouha Bay Stations N-1 through N-4 and S-1 through S-4	74

Introduction

Background and Objectives

Sediments on Guam's fringing reefs can be grouped into two broad categories. The first category of sediments is composed predominantly of organic carbonates derived from the skeletal remains of reef organisms and are thus called bioclastics. Such sediments are continuously produced with their composition and distribution being dependent upon the activities of grazing fishes, urchins, burrowing sponges, sipunculans, bivalves, and on factors such as community structure, wave exposure, current patterns, and reef morphology. The second category of sediments is composed mostly of detrital materials derived from the physical and chemical decomposition of the volcanic rocks of southern Guam. These materials consist of clay, silt, sand, rubble, organic detritus, and various kinds of dissolved materials.

Although reef communities are certainly affected by bioclastic sediments generated within the reef system, the organisms associated with reefs are generally adapted to such continuous long-term patterns of production and distribution. Sedimentation from terrestrial sources, though, is not so uniform in distribution and time. It is usually concentrated at river mouths and it comes in the form of pulses associated with periods of heavy rainfall resulting in high stream discharge rates. During periods of low rainfall, discharge is low and the water is relatively clear. Reef morphology and community structure are thereby naturally altered and adjusted to these rather unpredictable pulses of sedimentation near river and stream mouths which depend upon the size and nature of the drainage basin.

One of the principal effects on the marine environment from urbanization, agricultural and industrial development, and dredging and filling in of coastal areas is the impact of increased rates of sedimentation on the nearby reef systems. The effect of such activities on these reef systems range from negligible to catastrophic. It is well documented (Van Eepoel and Grigg, 1970; Maragos, 1972) that sedimentation has an adverse effect on planula settlement, coral growth, and reef development. Many other organisms associated with reefs are also badly affected. The development of fringing reefs is conspicuously altered, reduced, or absent in coastal river embayments where sedimentation rates are high. A gradient of decreased coral diversity is found from the mouths to the heads of these embayments. Such embayment areas can be used as natural laboratories to study the effects of terrestrial sediments on fringing reef systems.

Studies were conducted at two different river embayment locations to relate community structure to natural suspended sedimentation rates (Fig. 1). Ylig River and La Sa Fua River were selected as study sites

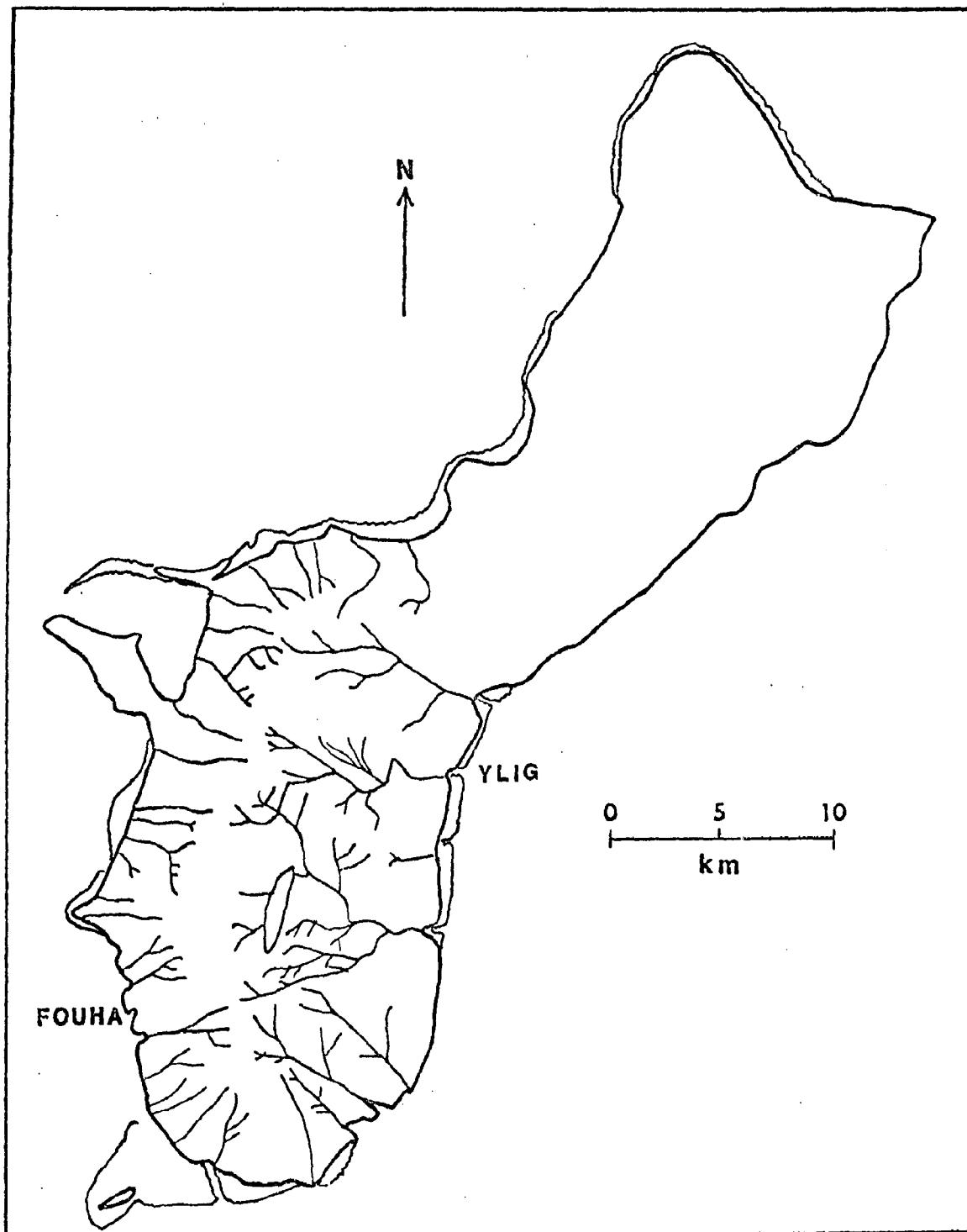


Fig. 1. Map of Guam showing the study sites at Fouha and Ylig Bays.

because a gradient of sedimentation rates were found where corals and most associated reef organisms are completely absent at the heads of the embayments, and become a diverse and well developed reef community at the mouths of the embayments.

The study was approached by measuring suspended sedimentation rates, total solids, pH, salinity, temperature and nutrient contents (phosphates and nitrates) in the water at eight stations along the gradient from the river mouths to the reef margins at La Sa Fua River (Fig. 2) and Ylig River (Fig. 3). These six factors will be analyzed for correlation with the biological components of the coral reef community.

By comparing the natural gradients of suspended sedimentation rates and community structure from the mouth to the head of these embayments, a cause and effect relationship can be determined. These values can be programmed with data from other reef environments to predict sedimentation impact due to increased input from land and coastal developments. These data will also be valuable in establishing performance standards for allowable sedimentation rates in reef environments.

General Description of the Bays

Although the geographic place names for the Fouha and Ylig study sites are referred to as bays (Figs. 2 and 3), the overall morphology of the two regions are more like submarine channels that penetrate through the fringing reefs from the outer margins to the river mouths at the shoreline. The sides of the submarine channels consist mostly of very steep slopes and cliff faces that are locally overhanging at many places along the upper part, and mostly steep slopes with fewer cliffs and overhanging walls along the lower part. The lower channel slopes at most places are buttressed with large boulders and blocks that have slumped downward from the upper channel walls. Some of the larger blocks are two or more meters across and give the lower channel areas much of their irregular relief. The channel floors composed for the most part of unconsolidated sediments of an undetermined thickness with a few mounds and pinnacles scattered along their length. In cross-section, at any one location, the channel floors are relatively flat, but along their length they slope gently downward from the river mouths in a seaward direction. Water depth in the channels range from 3 to 4 meters at the head to about 10 meters near the mouth at Fouha Bay and from 3 to 4 meters at the head to about 25 meters near the mouth at Ylig Bay. The principal physiographic features of the channel reefs and water depth are shown in vertical profile at each suspended sediment station at Fouha Bay in Figure 4, and at Ylig Bay in Figure 5.

Although the reef channel at Ylig Bay is considerably larger and somewhat deeper at the mouth than that at Fouha Bay, the principal differences between the two regions appear to be in the larger size of the drainage basin, and greater average, peak, and low flow discharge rates at the former. The drainage basin of the Ylig River is 6.58 sq. miles and based upon a 13 year period the average flow was 28.2 cfs, peak discharge

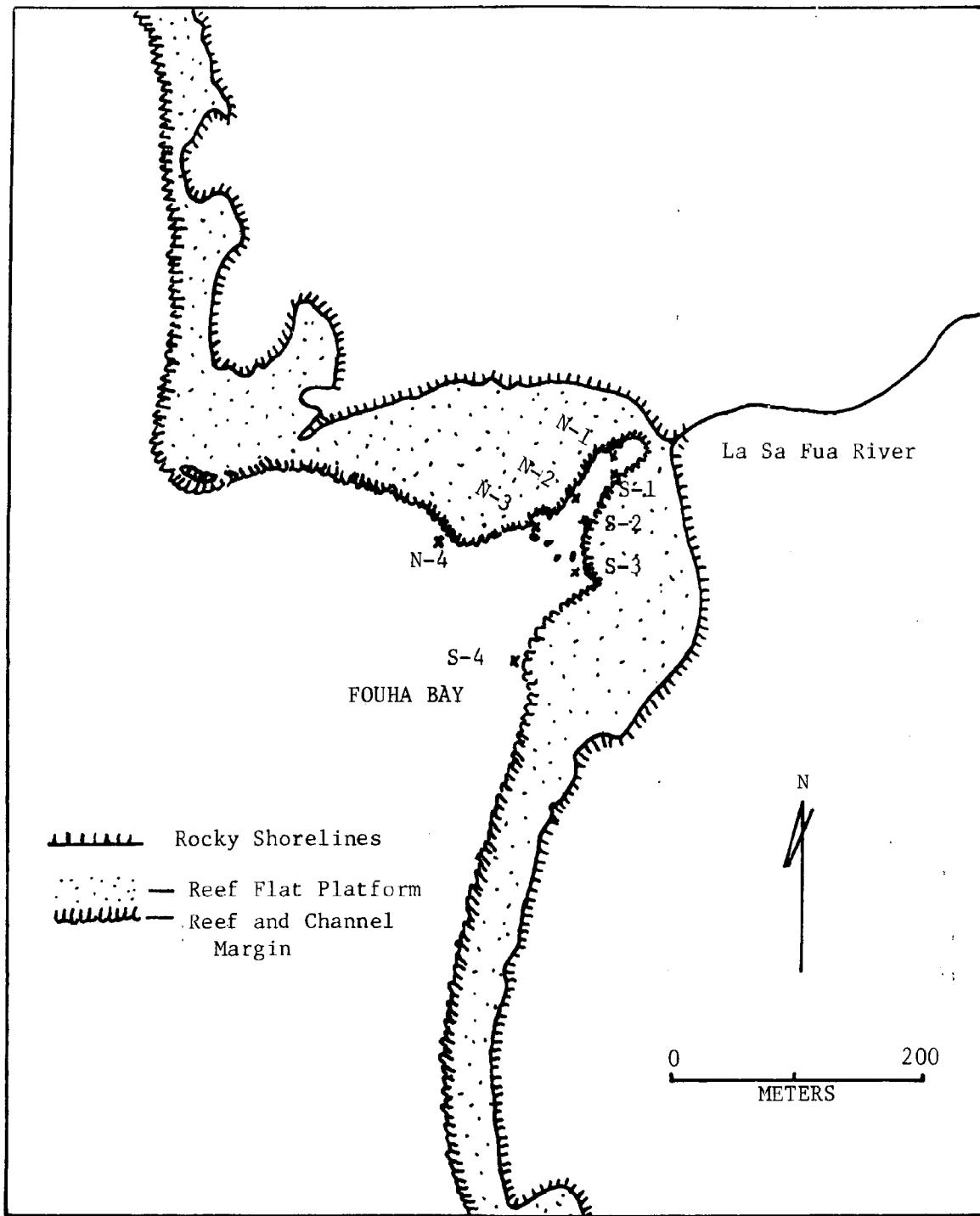


Fig. 2. Fouha Bay showing the locations of the sediment stations.

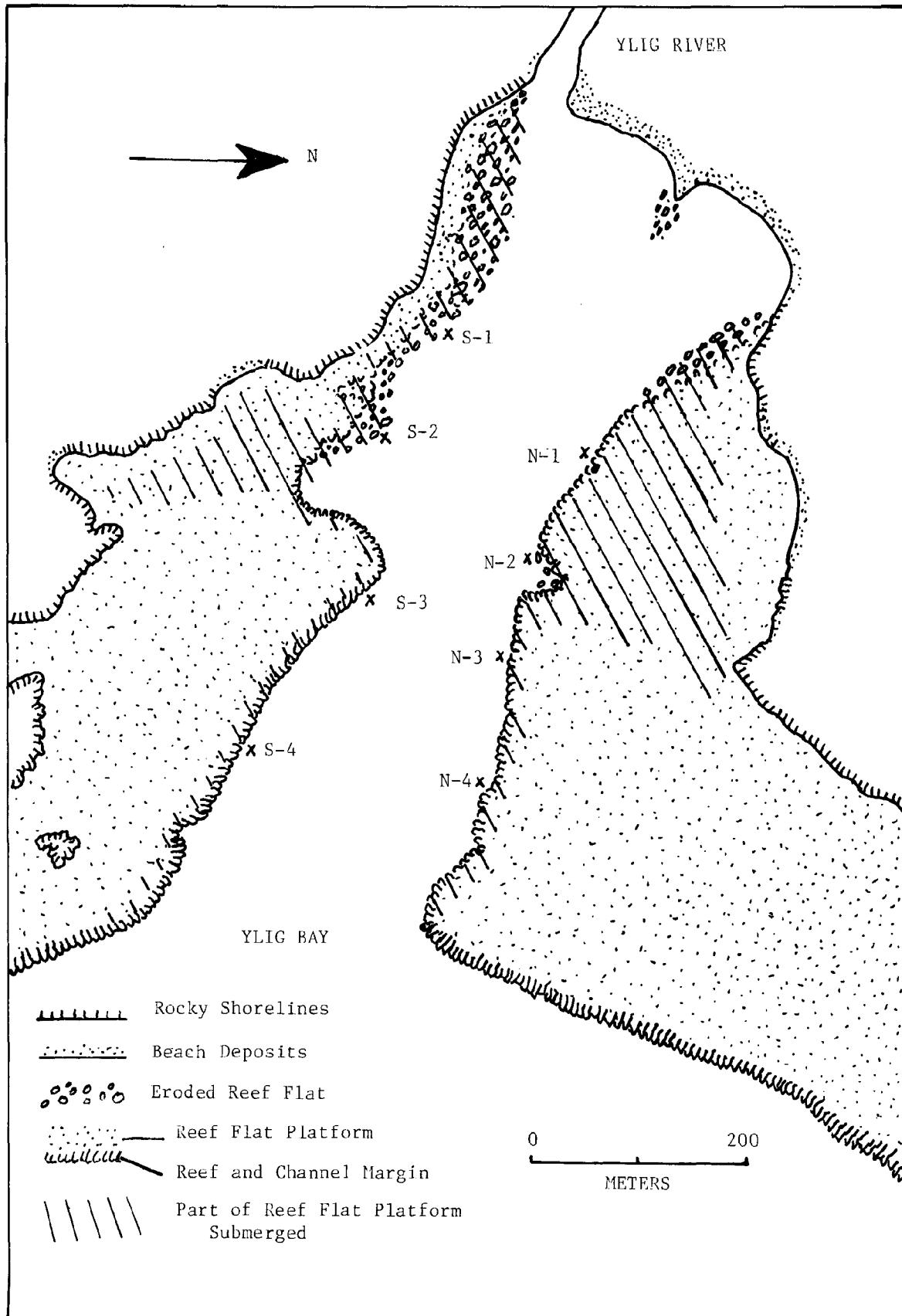


Fig. 3. Ylig Bay showing the location of the sediment stations.

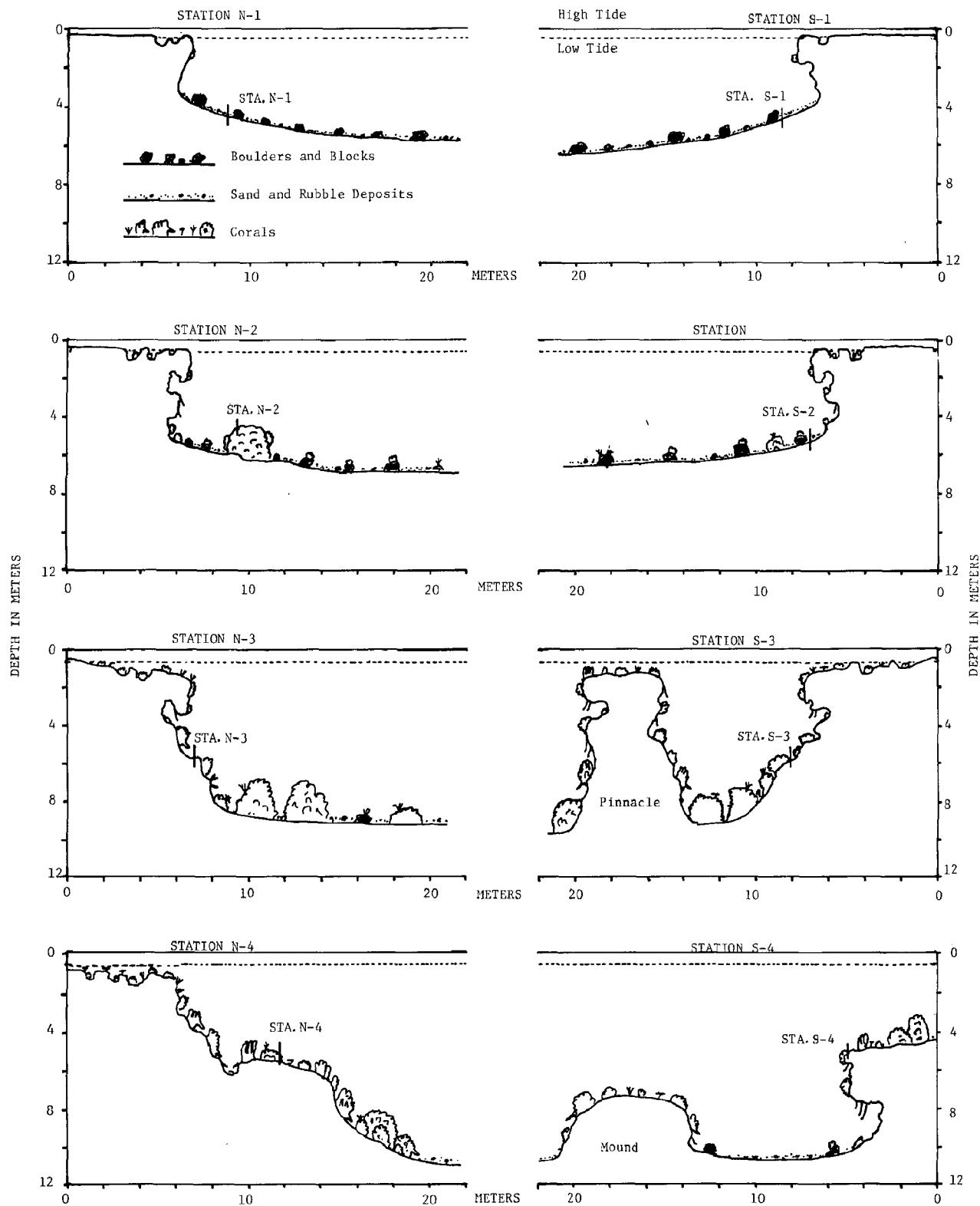


Fig. 4. Vertical profiles of the channel margin, slope, and floor in the vicinity of the sediment stations at Fouha Bay. Vertical exaggeration is X 1.

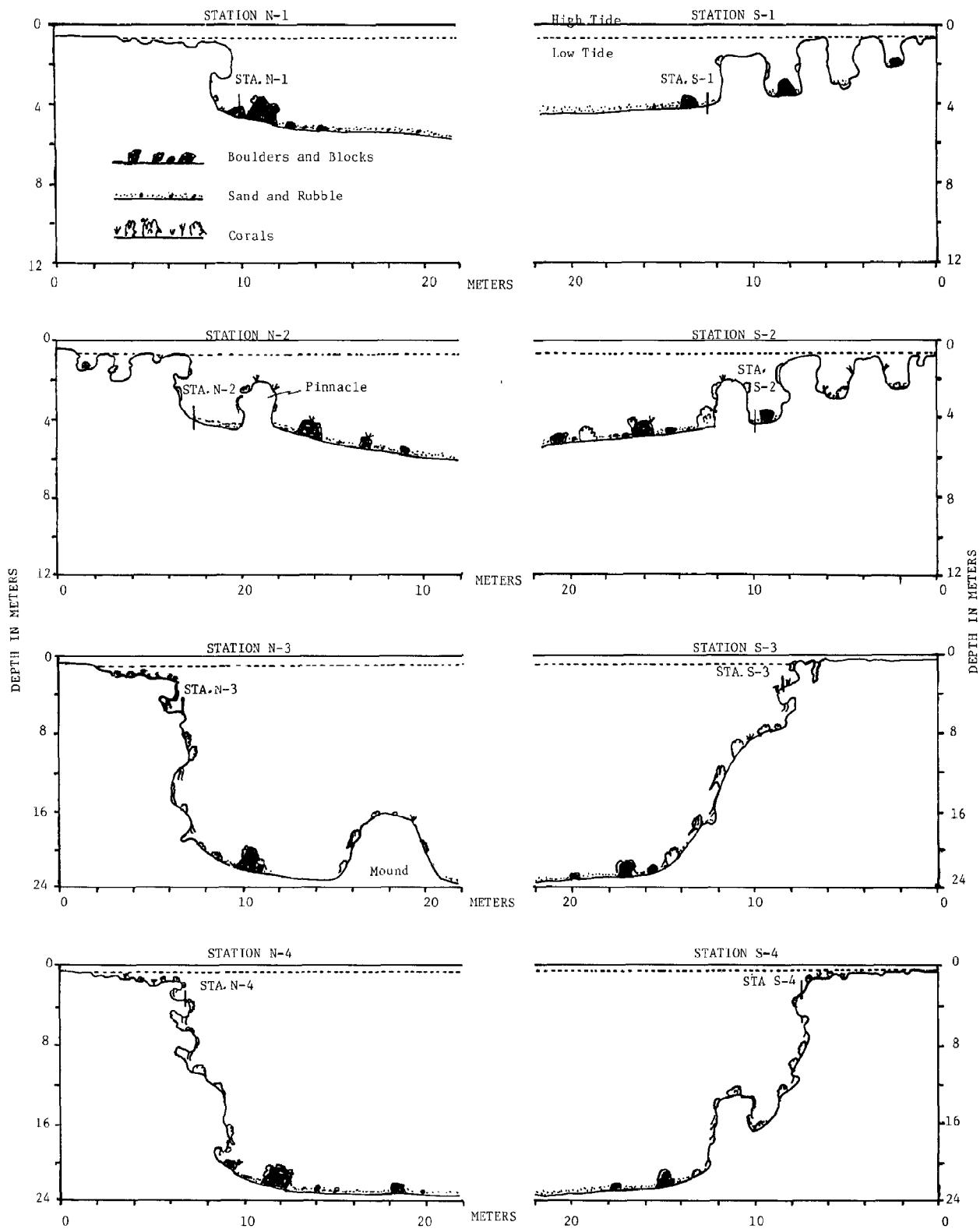


Fig. 5. Vertical profiles of the channel margin, slope, and floor in the vicinity of the sediment stations of Ylig Bay. Vertical exaggeration is X 1 for Stations N-1, N-2, S-1, and S-2 and X 2 for Stations N-3, N-4, S-3, and S-4.

was 4900 cfs on September 9, 1963, and minimum discharge was .5 cfs on June 2, 1965. The drainage basin of the La Sa Fua River is 1.93 sq. miles and based upon a 5 year period the average flow was 4.43 cfs, peak discharge was 1050 cfs on October 15, 1953, and minimum discharge was .29 cfs on May 11, 1958. Discharge data are taken from the Geologic Survey Water Supply Paper 1937 (1971).

Zonation Patterns

Because of the variation in reef physiography, community structure of the corals, and depth of the channel floor where the sediment trap tubes were placed, the channel reef in the vicinity of each suspended sediment station was divided into four zones.

The uppermost zone is the channel margin which consists a narrow peripheral band or shallow terrace 2 to 10 meters wide along the upper edge of the channel that retains water during low spring tides. The topography of the channel margin is irregular because of scattered holes and small knobs and pinnacles on the surface.

The channel wall is divided into two zones consisting of an upper slope and lower slope. The upper slope extends downward from the upper edge of the channel wall to the depth of the sediment trap tubes (3.8 to 4.6 meters) and the lower slope extends down to the unconsolidated sediments of the channel floor. The boundary between the upper and lower slopes is not a natural physiographic division, but was arbitrarily established to divided the channel wall into two coral communities--one above the sediment tube traps and one below them.

The fourth and lowermost zone is the channel floor which for the most part consists of a mixture of bioclastic sediments of reef origin and volcanic detrital sediments of terrestrial origin. A few boulders, blocks, and rocky mounds and pinnacles protude upward through the sediments here and there.

Methods

Physical and Chemical Characteristics of the Water

The physical and chemical characteristics of the water were sampled on four dates at three-month intervals in 1977, at ten stations in Fouha Bay and at eight stations in Ylig Bay. The sampling sites were each within a few decimeters of the apertures of the sediment trap tubes of each of the stations.

Water temperature was measured with a protected field thermometer which was taken underwater and laid near the sediment trap tubes for at least two minutes to allow the thermometer to equilibrate.

Water was sampled for chemical analysis by opening and closing the polyethylene sampling bottles underwater at the sampling stations. The bottles were then placed in an ice chest and transported to the freezer in the Water Resources Research Center (WRRC) laboratory room at the Marine Laboratory. The samples were analyzed for $\text{NO}_3\text{-N}$, $\text{NO}_2\text{-N}$ and $\text{PO}_4\text{-P}$ by the WRRC staff according to the methods of Strickland and Parsons (1968).

Salinity and pH were measured in samples brought to the surface in a plastic freezer jar. An American Optical Corporation refractometer was used to measure salinity. A Corning Model 610A portable pH meter was used to measure pH.

Measurement of Suspended Sediment Load

The suspended sediment load in the water column was measured at ten selected stations in Fouha Bay and at eight stations in Ylig Bay. Half of the stations were located along the north side of each bay and the other half of the stations were located at comparable locations along the south side of each bay. The first pair of stations (one on the north side of the bay, the other on the south side) was located where the first living coral colony was found as we swam seaward from the mouth of the river that emptied into the bay. The second pair of stations was found where living corals first became prevalent. The third pair of stations was located where the first living colony of Acropora was found and the fourth pair of stations was located where we judged the reef to be well developed and rich in species. A fifth pair of stations was established at Fouha Bay where the extent of coral cover and species richness have declined markedly as we moved seaward of the fourth stations. Stations were all established at depths of 3.8 to 4.6 m.

Suspended sediment load trap tubes consisted of PVC pipe (41 cm in length) that were strapped in groups of four (for replicate samples) to rebar rods. The rebar rods were hammered into the reef at the sampling stations to mark the location of the station and to keep the sediment tubes standing upright (see cover photograph). The apertures of half of the tubes

were bevelled and the apertures of the other half of the tubes were left truncated (Fig. 6) to test for the differences in sampling results from these two sets of tubes. No significant differences in results were found, so the data from these two sets of tubes were pooled.

The aperture diameters of the tubes made from the PVC pipes ranged between 22.75 and 24.25 mm (23.7 ± 0.44 mm), therefore the areas of the apertures ranged from 4.06 to 4.62 cm^2 ($\bar{Y} = 4.4 \text{ cm}^2$).

The tubes were left out for 6 weeks if possible. On one occasion, hazardous surf conditions prevented us from collecting the tubes on schedule. The data from delayed collection were each corrected for comparison with data from six-week exposures as explained in the tables in which the data were given.

Rubber stoppers were placed in the apertures of the tubes before the tubes were collected and brought to the laboratory. At the Marine Laboratory, the sediment was rinsed from the tubes into clean beakers that had been previously weighed and labeled. Distilled water was poured into the beaker. The sediment was then allowed to settle for 24 hours. The water was then decanted and this rinsing procedure was continued for four days (four rinsings, each once a day) to get rid of the salts from the seawater. Then, after the fifth decanting, the beakers with the sediment were placed in the drying oven for four days at 80°C . On the fifth day, the beakers were placed in a desiccator and allowed to reach room temperature beside the microbalance overnight. The beaker with dried sediment was then weighed and the weight of the empty beaker was subtracted.

Corals

The community structure of the corals was assessed at four zones in the vicinity of each of the suspended sediment stations (N-1 through N-4 and S-1 through S-4) at Fouha and Ylig Bays. The parameters assessed at each station were species diversity, frequency of occurrence, density, percent of substrate coverage, and colony size distribution data (\bar{Y} - average size, s -standard deviation, and w -size range). The fifth pair of stations at Fouha Bay were assessed only for percent of substrate coverage.

Frequency of occurrence, density, and percent of substrate coverage were calculated by using a point-quadrat method. The quadrat consists of a square frame, 35 cm on a side, that was divided into a grid of 49 intersecting points by small plastic lines spaced 5 cm apart. The quadrat was randomly tossed at each of the four channel reef zones within an area that extended ten meters to the left and right of each sediment trap station.

Frequency of occurrence of a species within a zone was determined by totaling the number of quadrats that the species was present and dividing it by the total number of tosses. Percent of substrate coverage for each species within a zone was calculated by totaling the number of quadrat points overlying the species for all the quadrat tosses and dividing it by the total number of possible points ($49 \times$ number of tosses) $\times 100$. Density of a species within a zone was determined by totaling the number of occurrences of the species within the quadrat for all the quadrat tosses

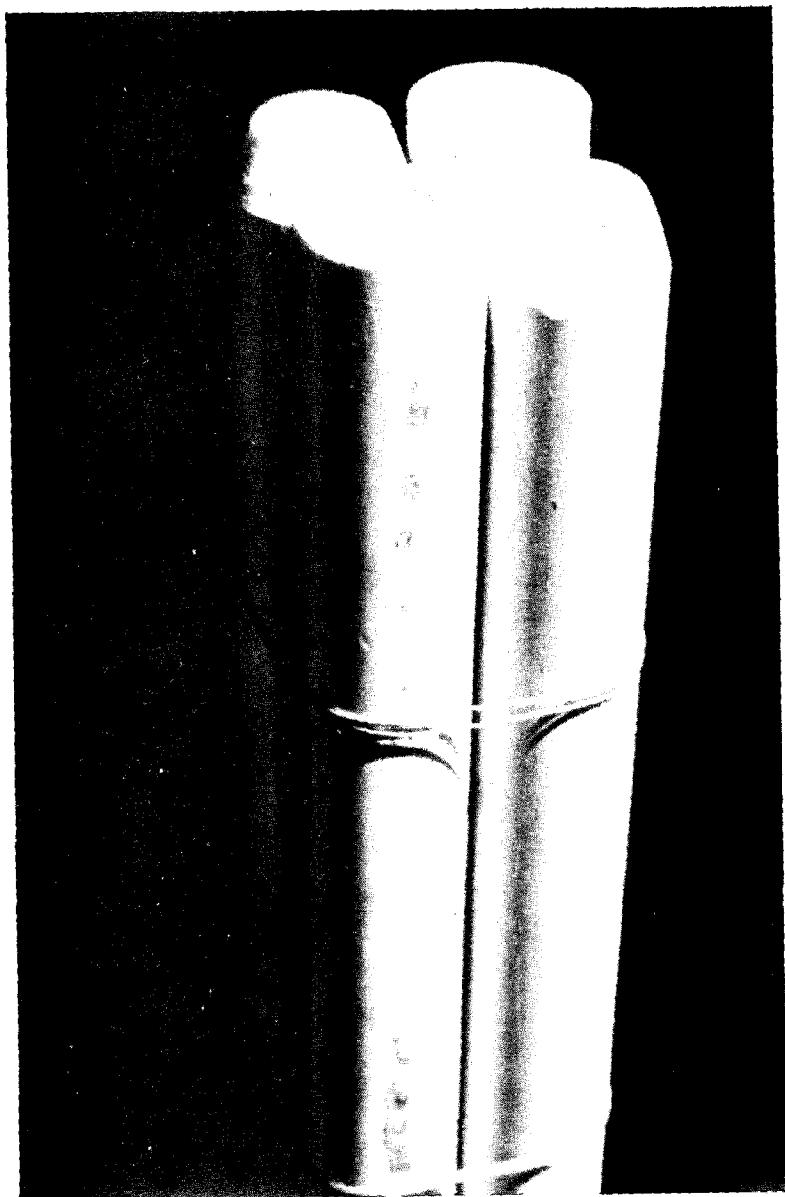


Fig. 6. Bevelled and truncated apertures on a set of suspended sediment load trap tubes.

and dividing it by the total area of all the tosses. A coral was considered to be within the confines of the quadrat if more than half of its area was inside the quadrat frame. Colony size distribution data for each species within a zone was calculated by recording the name and diameter, or greatest length and width, of all the colonies that occurred within each quadrat toss. In order to acquire a greater number of data for size distribution calculations, the name and size of the coral nearest each of the outside corners of the quadrat frame were also recorded for each toss. Only colonies within a distance of one meter from the quadrat corners were measured.

Species diversity was acquired by listing all the species that were encountered during the point-quadrat sampling for frequency, density, percent of substrate coverage, and size distribution data. Additional species were also recorded from observations made during the study period by snorkeling and scuba diving in the general area of each sediment trap station.

Results

Temperature, pH and salinity

The physical characteristics of the water (temperature, pH and salinity) varied significantly from day to day in both Fouha Bay and Ylig Bay (Tables 1-6). There were no significant differences between stations with either pH or salinity, partly because they both varied greatly between dates across all stations (Tables 3-6). For example, all stations in the bays might have lower salinities after a heavy rain. No stations in these bays appeared to vary in a significantly different manner from other stations in either pH or salinity.

In Fouha Bay, a relatively small bay, there were no significant differences in water temperatures between stations (Table 1). This was partly because they all varied together between dates. In Ylig Bay, a larger bay, there was a very slight tendency for Station S-2 to have higher temperatures than the other stations. This was probably because Station S-2 was farther back into a shallow embayment off the main river channel than were the other stations. Partly because of this, there was a difference (just barely significant) between stations for water temperature in Ylig Bay (Table 2).

Temperature, pH and salinity were found to be of no value in our study as environmental factors to correlate with characteristics of the reef community. These environmental factors are of importance in influencing the characteristics of reef communities on a larger scale, but within the scale of our study areas these factors all varied significantly with time. There were no very significant differences between stations, therefore we cannot correlate reef characteristics with these environmental factors within these bays.

Nitrates and phosphates

As with temperature, pH and salinity, the nitrate and phosphate levels in the water generally varied so greatly between sample dates that it was very difficult to demonstrate differences between stations. Phosphate levels varied significantly between dates in both Fouha Bay and Ylig Bay and nitrate levels varied significantly between dates in Fouha Bay (Tables 7-9).

The variation from measurement error or differences in nitrate and phosphate levels was very great between water samples taken only moments apart. Variations between replicate samples at each station were so great that no significant differences could be found between stations on a given day in terms of phosphate levels in the water along the north side of bays versus the south sides in either bays (Fouha or Ylig), between

Table 1. Temperature ($^{\circ}$ C) of the water near the mouth of the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	27.9	29.0	30.2	28.2
S - 2	28.0	28.9	29.8	28.2
S - 3	28.2	28.8	29.2	28.2
S - 4	28.0	28.9	30.5	28.3
S - 5				28.3
N - 1	28.0	29.0	30.1	28.2
N - 2	27.9	28.9	30.1	28.2
N - 3	28.4	28.9	30.4	28.2
N - 4	28.0	29.0	29.8	28.2
N - 5				28.3

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	6.38	128 ***
Stations	7	.055	1.10 ns
Error	21	.0499	

Table 2. Temperature ($^{\circ}\text{C}$) of the water near the mouth of the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	28.1	30.5	28.7	28.5
S - 2	28.1	30.3	30.2	29.0
S - 3	27.3	29.6	29.65	28.0
S - 4	27.2	29.8	29.45	27.9
N - 1	27.6	29.6	29.6	28.0
N - 2	27.7	29.8	29.8	28.5
N - 3	27.5	30.2	29.7	27.8
N - 4	27.4	29.6	29.75	27.85

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	9.84	92.3***
Stations	7	.286	2.68*
Error	21	.1066	

Table 3. Water pH near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	8.0	8.0	7.7	8.4
S - 2	8.0	8.0	7.7	8.4
S - 3	8.1	8.0	7.6	8.2
S - 4	8.05	7.9	7.8	8.2
S - 5				8.25
N - 1	8.1	8.0	7.7	8.1
N - 2	7.95	7.9	7.8	8.1
N - 3	7.95	7.9	7.8	8.3
N - 4	8.05	7.9	7.7	8.15
N - 5				8.15

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	.3502	48.4***
Stations	7	.0044	.603 ns
Error	21	.0072	

Table 4. Water pH near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	8.1	7.55	7.8	8.2
S - 2	8.2	7.5	8.0	8.2
S - 3	8.1	7.45	8.1	7.7
S - 4	8.1	7.45	8.0	7.9
N - 1	8.1	7.6	7.9	8.0
N - 2	8.1	7.55	8.1	8.1
N - 3	8.1	7.50	8.1	7.8
N - 4	8.0	7.55	8.1	7.8

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	.54	36.3***
Stations	7	.01	.67 ns
Error	21	.0149	

Table 5. Water salinity ($^{\circ}/\text{o}$) near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	34	35	33.3	36
S - 2	36	38	33.3	35
S - 3	36	35	33.3	35
S - 4	36	35	34.4	36
S - 5				36
N - 1	35.5	35	32.2	35
N - 2	33	35	32.8	34
N - 3	35.5	35	33.3	34
N - 4	35.5	35	34.4	35
N - 5				36

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	6.76	9.8**
Stations	7	1.38	2.007 ns
Error	21	.690	

Table 6. Water salinity near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	34	34.3	31	33
S - 2	34.5	32	32	34
S - 3	34	36	31.8	34
S - 4	35	34	32	34
N - 1	34.5	34	31.5	33
N - 2	34	34	31.5	34
N - 3	35	34	31.5	34
N - 4	34	34	32	35

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	12.19	25.8***
Stations	7	.466	.99 ns
Error	21	.474	

Table 7 . Phosphate levels ($\mu\text{g-at/l}$) in the water near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	.11	.20	.22	.19
S - 2	.12	.18	.19	.18
S - 3	.13	.20	.16	.14
S - 4	.14	.16	.15	.14
S - 5				.19
N - 1	.12	.24	.18	.19
N - 2	.11	.14	.17	.18
N - 3	.13	.18	.20	.19
N - 4	.11	.15	.16	.17
N - 5				.15

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	.00695	24.3***
Stations	7	.0009	3.12*
Error	21	.0003	

Table 8. Phosphate levels ($\mu\text{g-at/l}$) in the water near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	.19	.09	.09	.19
S - 2	.16	.08	.09	.13
S - 3	.18	.10	.10	.23
S - 4	.19	.10	.12	.20
N - 1	.19	.16	.19	.20
N - 2	.05	.10	.10	.12
N - 3	.23	.08	.11	.14
N - 4	.13	.07	.14	.13

<u>Source of variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Dates	3	.0093	8.2*
Stations	7	.0033	2.9*
Error	21	.0011	

Table 9. Nitrate levels ($\mu\text{g-at/l}$) in the water near the sediment traps at the ten stations in Fouha Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	23 III 1977	15 VI 1977	22 IX 1977	15 XII 1977
S - 1	.25	.95	.21	1.8
S - 2	.49	1.2	.28	.59
S - 3	.39	.80	.37	.22
S - 4	.42	.82	.41	.17
S - 5				.17
N - 1	.42	.41	.21	.14
N - 2	.35	2.0	.23	.32
N - 3	.74	1.2	.34	.47
N - 4	.28	.46	.28	.18
N - 5				.27

<u>Source of variation</u>	<u>df'</u>	<u>MS</u>	<u>Fs</u>
Dates	3	.738	4.9*
Stations	7	.156	1.04 ns
Error	21	.1506	

Table 10. Nitrate levels ($\mu\text{g-at/l}$) in the water near the sediment traps at the eight stations in Ylig Bay on the four collecting dates at 3-month intervals through the year.

STATIONS	Collection Dates			
	30 III 1977	22 VI 1977	29 IX 1977	22 XII 1977
S - 1	.62	1.3	2.6	.70
S - 2	.12	.32	1.3	1.4
S - 3	.21	4.3	.98	.40
S - 4	.28	.77	2.1	.73
N - 1	.18	.45	1.3	.63
N - 2	.16	.36	.65	.36
N - 3	.21	.59	.70	.55
N - 4	.18	.56	.89	.53

Source of variation	df	MS	Fs
Dates	3	1.77	2.99 ns
Stations	7	.6127	1.04 ns
Error	21	.5915	

stations along a river mouth to the seaward gradient in either of the bays, or in the interaction between the side of the bay and the position along the seaward gradient (Tables 11 and 12). Similarly, no significant differences in nitrate levels could be found between any of these arrays of stations in Fouha Bay (Table 13).

A part of the variation between replicate samples in this study was undoubtedly caused by problems with laboratory methods, but probably another part of the variation was caused by changes in tidal state, wave action, turbulence, time of day, currents and weather. These sources of variation along with variation between dates were so large that precise measurements from a moment in time were of little, if any, value to our studies of the characteristics of the reef community within the scale of the studies. For these measurements to be of value, they should be taken very frequently or, alternatively, with some integrative measurement such as that by which suspended sediment load was determined. If this could be done, the measurements of nitrates and phosphates might be of value.

There appears to be a general trend for a decrease in nitrate and phosphate contents of water between river mouth and seaward stations. However, this trend was very vague. Statistical tests were performed on the eight possible comparisons of near shore versus offshore stations for phosphate or nitrate levels in water from the north or south sides of Fouha Bay or Ylig Bay. Only one of these comparisons showed a significant difference. There was a significantly greater concentration ($t_{s[6]}=3.708^{**}$) of phosphates at the nearshore Station N-1 (.18 ± .02 µg - at/l) than at the offshore Station N-4 (.12 ± .03 µg - at/l) in Ylig Bay. However, there was a lower concentration of phosphates at the nearshore Station S-1 than at the offshore Station S-4. Therefore, the general trend for a reduction in nutrients from nearshore to offshore stations was very weak if it existed at all. There was a significant difference between pairs of stations in Fouha Bay in terms of phosphate levels in the continuous gradient from nearshore to offshore stations (Table 7).

A paired comparison by a two-way anova with a randomized block design was made between comparable stations on north and south sides of each bay (Table 15). There were no differences in phosphate levels on the two sides in either bay. However, there was a significantly greater concentration of nitrates in the water along the south side of Ylig Bay than along the north side (Tables 14 and 15).

In summary, the variations between replicate samples and between dates were so great for the nitrate and phosphate data that it was difficult to determine any significant trends. There was a vague tendency for nitrates and phosphates to decrease along a nearshore to offshore gradient and there was a significantly greater concentration of nitrates along the south shore than along the north shore of Ylig Bay.

Table 11. Phosphate levels ($\mu\text{g-at/l}$) in replicate samples in the water near the sediment traps at the ten stations in Fouha Bay on 15 XII 1977.

STATIONS	NORTH	SOUTH	Σ
1	.18	.17	.75
	.20	.20	
2	.18	.20	.71
	.17	.16	
3	.17	.14	.65
	.20	.14	
4	.15	.13	.61
	.18	.15	
5	.15	.20	.66
	.14	.17	
Σ	1.72	1.66	3.38

Source of Variation	df	MS	Fs
North versus South	1	.00019	.6 ns
Stations along a seaward gradient	4	.00078	2.5 ns
Interaction of stations and side of bay	4	.00108	3.4 ns
Error	10	.00031	

Table 12. Phosphate levels ($\mu\text{g-at/l}$) in replicate samples in the water near the sediment traps at the eight stations in Ylig Bay on 1 II 1978.

STATIONS	NORTH	SOUTH	Σ
1	.13	.21	.79
	.28	.17	
2	.12	.11	.49
	.12	.14	
3	.14	.32	.73
	.14	.13	
4	.13	.23	.65
	.13	.16	
Σ	1.19	1.47	2.66

Source of Variation	df	MS	Fs
North versus South	1	.0055	1.34 ns
Stations along a seaward gradient	3	.0042	1.02 ns
Interaction of stations and side of bay	3	.0022	.54 ns
Error	8	.0041	

Table 13. Nitrate levels ($\mu\text{g-at/l}$) in replicate samples in the water near the sediment traps at the ten stations in Fouha Bay on 8 II 1978.

STATION	NORTH	SOUTH	Σ
1	.14	.11	3.88
	3.47	.16	
2	.34	.20	1.81
	.84	.43	
3	.23	.45	1.36
	.20	.48	
4	.09	.14	.71
	.25	.23	
5	.04	.27	.88
	.30	.27	
Σ	5.9	2.74	8.64

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
North versus South	1	.497	.86 <u>ns</u>
Stations along a seaward gradient	4	.408	.71 <u>ns</u>
Interaction of stations and side of bay	4	.607	1.05 <u>ns</u>
Error	10	.576	

Table 14. Nitrate levels ($\mu\text{g-at/l}$) in replicate samples in the water near the sediment traps at the eight stations in Ylig Bay on 1 II 1978.

STATION	NORTH	SOUTH	Σ
1	.48	.97	2.66
	.77	.44	
2	.29	1.7	3.63
	.44	1.2	
3	.73	.48	1.89
	.37	.31	
4	.68	.73	2.51
	.37	.73	
Σ	4.13	6.96	10.69

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
North versus South	1	.353	6.19*
Stations along a seaward gradient	3	.121	2.12 <u>ns</u>
Interaction of stations and side of bay	3	.286	5.02*
Error	8	.057	

Table 15. Paired comparisons of station S-1 versus N-1, S-2 versus N-2, S-3 versus N-3 and S-4 versus N-4, in terms of nitrate and phosphate contents of the water with all comparisons made between samples taken on the same dates. The data are given in Tables 11 through 14. The results of two-way anova are given here.

a) Nitrate levels in Fouha Bay

	<u>df</u>	<u>MS</u>	<u>Fs</u>
North versus South side of the bay	1	.045	.34 <u>ns</u>
Station pairs	16	.273	2.06 <u>ns</u>
Error	16	.133	

b) Phosphate levels in Fouha Bay

	<u>df</u>	<u>MS</u>	<u>Fs</u>
North versus South side of the bay	1	.000026	.06 <u>ns</u>
Station pairs	16	.0018	4.26**
Error	16	.0004	

c) Nitrate levels in Ylig Bay

	<u>df</u>	<u>MS</u>	<u>Fs</u>
North versus South side of the bay	1	3.02	6.71*
Station pairs	15	.83	1.84 <u>ns</u>
Error	15	.45	

d) Phosphate levels in Ylig Bay

	<u>df</u>	<u>MS</u>	<u>Fs</u>
North versus South side of the bay	1	.0003	.18 <u>ns</u>
Station pairs	15	.0034	2.14 <u>ns</u>
Error	15	.0016	

Suspended sediment load

Measurements of suspended sediment loads were made for eight continuous 6-week periods of time at each of our stations in both Fouha Bay and Ylig Bay (Tables 16 and 17). (Some of the samples are missing because the missing sediment load trap tubes were torn away by heavy wave action. Two of the time periods were longer than six weeks because hazardous wave conditions prevented us from collecting them on schedule. Each of the data for the delayed collection were adjusted for comparison with data from 6-week exposures as explained at the bottom of the tables.)

In contrast to our nitrate and phosphate data, our continuous sampling of suspended sediment loads in tubes provided us with data that had essentially negligible variance between replicate samples (error variance, cf. Tables 18 and 19). Because of this, we could clearly determine the sources of variance (Tables 18 and 19). There was a significant difference between the suspended sediment loads from each of the stations. These differences were caused in large part by a major decrease in suspended sediment load along a gradient from the river mouth towards the open sea. The stations also differed significantly in a comparison of counterpart stations on the north and south sides of the bay. All stations on the south side of the bays differed from their counterpart stations on the north sides of the bays. However, the direction of these differences alternated. In Fouha Bay, Stations N-1, S-2, N-3 and S-4 had greater average suspended sediment loads than their respective counterparts S-1, N-2, S-3 and N-4. In Ylig Bay, Stations S-1, N-2, S-3 and N-4 had greater average suspended sediment loads than their respective counterparts N-1, S-2, N-3 and S-4.

There were also very significant differences between the average suspended sediment loads from different 6-week time periods (Tables 18 and 19). We observed these differences to be related to wave action. After periods of storm and heavy wave action, our suspended sediment load measurements were always larger.

The direction and strength of winds and wave action on both of the bays varied between time periods to the extent that the relative differences between stations changed with time, i.e., there was a significant interaction between time periods and stations (Tables 18 and 19).

Ylig Bay is a relatively large bay, with relatively great distances between stations, while Fouha Bay is smaller, with the stations closer together. Fouha Bay is generally protected from heavy wave action, but when occasionally subjected to storm waves the entire small bay is strongly affected. These aspects of a comparison between Fouha Bay and Ylig Bay can be observed in Tables 18 and 19. Note that the variance ($MS =$ mean square) between 6-week periods is over three times as great as the variance between stations in Fouha Bay, while the variance between stations is nearly three times as great as the variance between 6-week periods

Table 16. Dry weights (in gms) of sediments collected in sediment trap tubes (4.4 cm² aperture area) over 6-week periods in Fouha Bay. The mean and standard deviation are given for dry weights from a series of four tubes (n=4) at each station on each collecting date. Stations S-5 and N-5 were set up for only the last two collections. (Several collections are missing from the last four dates because of heavy wave action.)

STATIONS	FOUHA BAY					Dates on which samples were taken	2 II 78**
	23 III 77	4 V 77	15 VI 77	28 VII 77	22 IX 77*		
S - 1	10.57 ± 2.17	.61 ± .01	1.39 ± .73	3.04 ± .26	92.4 ± 5.56	92.88 ± 10.98	105.98 ± 11.80
S - 2	4.31 ± 2.79	.23 ± .09	.68 ± .31	1.97 ± .91		72.80 ± 4.50	.81 ± .96
S - 3	1.94 ± .18	.12 ± .01	.22 ± .13	.91 ± .22		16.04 ± 1.79	
S - 4	1.16 ± .20	.08 ± .01	.30 ± .08	.48 ± .12			.87 ± .20
S - 5						100.12 ± 9.88	8.72 ± 1.12
N - 1	7.17 ± .23	.35 ± .18	1.66 ± .13	2.78 ± .20		90.83 ± 14.05	114.53 ± 7.04
N - 2	2.79 ± .05	.28 ± .06	1.15 ± .08	1.91 ± .28	46.65 ± 9.12	37.64 ± 2.07	55.75 ± 3.04
N - 3	2.36 ± .28	.33 ± .11	.98 ± .07	1.28 ± .04	35.32 ± 2.91	22.82 ± .83	31.28 ± 2.04
N - 4	.67 ± .06	.11 ± .02	.23 ± .10	.56 ± .02		2.12 ± .14	.37 ± .04
N - 5						8.95 ± .37	3.21 ± 2.92

*The data from this 8-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/8)

**The data from this 7-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/7).

Table 17. Dry weights (in gms) of sediments collected in sediment trap tubes (4.4 cm^2 aperture area) over 6-week periods in Ylig Bay. The mean and standard deviation are given for dry weights from a series of four tubes ($n=4$) at each station on each collecting date. (The last collection from Station N-4 is missing because the set of tubes was presumably carried away by wave action.)

STATIONS	Ylig Bay						
	30 III 77	11 V 77	22 VI 77	4 VIII 77	29 IX 77*	11 XI 77	22 XII 77
S - 1	39.29 ± .99	35.55 ± .20	28.41 ± .99	29.15 ± 1.88	12.66 ± 3.00	56.70 ± .77	11.52 ± .92
S - 2	4.35 ± .59	2.37 ± .09	1.16 ± .17	1.97 ± .55	1.28 ± .90	9.52 ± 1.12	4.26 ± .33
S - 3	4.36 ± .15	4.11 ± .21	1.93 ± .50	1.42 ± .72	2.64 ± .12	13.32 ± .42	9.40 ± .42
S - 4	3.23 ± .11	2.61 ± .18	1.32 ± .14	1.98 ± .12	1.18 ± .12	7.29 ± .27	3.17 ± 1.53
N - 1	7.29 ± .67	6.46 ± .53	1.32 ± .83	1.98 ± .82	9.22 ± 3.49	33.83 ± 10.85	62.22 ± 1.01
N - 2	7.16 ± .64	4.72 ± .52	1.43 ± .74	2.20 ± .65	7.36 ± 2.58	21.56 ± 1.34	7.06 ± .32
N - 3	3.63 ± .13	3.26 ± .23	1.33 ± .29	2.03 ± .31	2.35 ± .35	7.03 ± .38	3.39 ± .22
N - 4	3.78 ± .09	2.82 ± .10	1.77 ± .09	2.29 ± .38	1.67 ± .25	9.00 ± 1.21	2.81 ± .02

*The data from this 8-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/8).

**The data from this 7-week period were each adjusted for comparison with the data from the 6-week periods by multiplying by a conversion factor (6/7).

Table 18. Analysis of sources of variation in suspended sediment load measurements in Fouha Bay.

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Between 6-week periods	3	80.3	177.3***
Between stations	7	24.4	53.9***
Interaction of stations with 6-week periods	21	8.9	19.7***
Error (between 4 tubes at each station)	96	.453	

Table 19. Analysis of sources of variation in suspended sediment load measurements in Ylig Bay.

<u>Source of Variation</u>	<u>df</u>	<u>MS</u>	<u>Fs</u>
Between 6-week periods	6	967.6	323***
Between stations	7	2711.9	904***
Interaction of stations with 6-week periods	42	343.8	114.6***
Error (between 4 tubes of each station)	168	2.999	

Table 20. Average suspended sediment load measurements (gms dry weight) for 4.4 cm² I.D. tubes over 6-week periods at sampling stations in Fouha Bay and Ylig Bay from March 1977 through February 1978. (Refer to the text for the method of calculation used.)

<u>STATION</u>	<u>SIDE OF BAY</u>	
	<u>SOUTH</u>	<u>NORTH</u>
Fouha Bay		
1	38.8	42.1
2	24.65	18.5
3	6.04	11.9
4	6.25	1.24
5	38.6	4.20
Ylig Bay		
1	33.1	18.2
2	4.62	8.50
3	5.76	4.22
4	3.50	4.42

in Ylig Bay.

The differences in average suspended sediment load between stations might be related to characteristics of the marine communities at these stations. To obtain a comparative index of the suspended sediment load for each station, an average was taken over the eight 6-week period measurements for each station for which all eight sets of measurements were available (Table 20). Since data were missing for some of the stations during certain 6-week periods, and because there were significant differences between 6-week periods, the relative magnitudes of available measurements on suspended sediment loads from stations with missing 6-week periods were compared with measurements from the same 6-week periods from data of stations with complete data for eight 6-week periods. Because of the significant differences between 6-week periods, the average of suspended sediment load measurements from the incomplete stations were multiplied by a factor of a mean ratio from the complete stations of the total eight 6-week periods average from each station divided by the average of those 6-week periods that were available in the incomplete stations and were used in the comparisons. Although this derived index is weak because there is a significant interaction between stations and 6-week periods, the variance from the interaction is much less than the variances from the 6-week periods and stations (Tables 18 and 19). Therefore, the index we use is permissible and it is the best one we can derive under the circumstances.

Corals

The results of the survey of characteristics of the coral community are presented in Tables 21 to 29 and are discussed in the following section in relation to the suspended sediment load measurements. The distributions among the eight stations in both of the bays of each of the 161 species of corals are given in Table 21. The data on abundance and prevalence of each of the coral species are given in Table 22 for Fouha Bay and in Table 23 for Ylig Bay. Size distributions of coral populations on different zones of the reef are given for each of the stations for Fouha Bay in Table 24 and for Ylig Bay in Table 25. Frequency distributions for coral colony diameters for each of the zones at each of the stations are given in Tables 26 and 27 and the frequency distributions of colony growth forms are given in Tables 28 and 29.

Table 21. Species list of corals for Fouha and Ylig Bay Stations N-1 through N-4 and S-1 through S-4.

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
CLASS - ANTHOZOA																
ORDER - SOLERACTINIA																
SUBORDER - ASTROCOENITINA																
FAMILY - ASTROCOENIDAE																
<i>Stylocoeniella armada</i> (Ehrenberg)																
<i>Stylocoeniella guentheri</i> (Bassett-Smith)	X	X	X	X												
FAMILY - THAMNASTERIIDAE																
<i>Psammocora contigua</i> (Esper)																
<i>Psammocora digitata</i> Mine-Edwards and Haime	X	X	X	X												
<i>Psammocora nierstraszii</i> vander Horst	X	X	X	X												
<i>Psammocora (Plesiocora) halmeana</i> Milne																
<i>Edwards and Haime</i>																
<i>Psammocora</i> (Encrusting sp. 1)	X	X	X	X												
<i>Psammocora</i> (Ramoise sp. 1)																
FAMILY - POCILLIOPORIDAE																
<i>Stylophora mordax</i> (Dana)																
<i>Seriatopora hystrix</i> (Dana)	X	X	X	X												
<i>Pocillopora brevicornis</i> Lamarck																
<i>Pocillopora danicornis</i> (Linnaeus)	X	X	X	X												
<i>Pocillopora danae</i> Verriill																
<i>Pocillopora elegans</i> Dana	X	X	X	X												
<i>Pocillopora eydouxi</i> Mine Edwards & Haime																
<i>Pocillopora ligulata</i> Dana	X	X	X	X												
<i>Pocillopora meandrina</i> Dana																
<i>Pocillopora setchelli</i> Hoffmeister	X	X	X	X												
<i>Pocillopora verrucosa</i> (Ellis & Solander)	X	X	X	X												
<i>Pocillopora woodjonesi</i> Vaughan																
<i>Pocillopora</i> (Ramoise sp. 1)																

Table 21, continued

CORALS	FOUHA BAY STATIONS						YILIG BAY STATIONS									
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
<i>Acropora brueggemannii</i> (Brock)			X						X						X	X
<i>Acropora delicatula</i> (Brook)		X	X						X						X	X
<i>Acropora formosa</i> (Dana)		X	X						X						X	X
<i>Acropora humilis</i> (Dana)		X	X						X						X	X
<i>Acropora hystrix</i> (Dana)		X	X						X						X	X
<i>Acropora irregularis</i> (Brook)		X	X						X						X	X
<i>Acropora kentii</i> (Brook)		X	X						X						X	X
<i>Acropora monticulosa</i> (Bruggemann)		X	X						X						X	X
<i>Acropora nana</i> (Studer)		X	X						X						X	X
<i>Acropora nasuta</i> (Dana)		X	X						X						X	X
<i>Acropora ocellata</i> Klunzinger									X						X	X
<i>Acropora palifera</i> (Lamarck)		X	X						-	X					X	X
<i>Acropora palmata</i> Wells									X						X	X
<i>Acropora ramburi</i> (Bassett Smith)									X						X	X
<i>Acropora rayneri</i> (Brook)									X						X	X
<i>Acropora smithi</i> (Brook)		X							X						X	X
<i>Acropora squarrosa</i> (Ehrenberg)		X	X						X						X	X
<i>Acropora surculosa</i> (Dana)		X	X						X						X	X
<i>Acropora syringodes</i> (Brook)		X	X						X						X	X
<i>Acropora valida</i> (Dana)		X	X						X						X	X
<i>Acropora wardii</i> Verrill		X	X						X						X	X
<i>Acropora</i> (Corymbose sp. 1)		X	X						X						X	X
<i>Acropora</i> (Corymbose sp. 2)		X	X						X						X	X
<i>Astreopora gracilis</i> Bernard		X	X						X						X	X
<i>Astreopora listeri</i> Bernard		X	X						X						X	X
<i>Astreopora myriophthalma</i> (Lamarck)		X	X						X						X	X
<i>Astreopora</i> (Massive sp. 1)		X							X						X	X
<i>Montipora acanthella</i> Bernard		X							X						X	X
<i>Montipora caliculata</i> (Dana)		X	X						X						X	X
<i>Montipora elechneri</i> Vaughan		X	X						X						X	X
<i>Montipora ehrenbergii</i> Verrilli									X						X	X
<i>Montipora foliosa</i> (Pallas)									X						X	X
<i>Montipora foreolata</i> (Dana)		X	X						X						X	X
<i>Montipora granulosa</i> Bernard		X	X						X						X	X
<i>Montipora hoffmeisteri</i> Wells		X	X						X						X	X
<i>Montipora lobulata</i> Bernard		X	X						X						X	X
<i>Montipora monasteriata</i> (Forskaal)		X	X						X						X	X

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIQ BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
<u>Montipora patula</u> Verriill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora sinensis</u> Bernard	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora socialis</u> Bernard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Montipora tuberculosa</u> (Lamarck)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Montipora verrilli</u> Vaughan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora verrucosa</u> (Lamarck)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora</u> (Tuberculate sp. 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora</u> (Tuberculate sp. 2)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora</u> (Tuberculate sp. 3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Montipora</u> (Papillate sp. 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora</u> (Papillate sp. 2)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora</u> (Foliate sp. 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Montipora</u> (Glabrous sp. 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SUBORDER - FUNGLINA																
FAMILY - AGARICITIDAE																
<u>Agariciella planulata</u> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona clavus</u> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona decussata</u> Dana	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona divaricata</u> (Lamarck)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Pavona maldivensis</u> (Gardiner)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<u>Pavona minuta</u> Wells	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona varians</u> Verriill	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona</u> (<u>Polystra</u>) <u>obtusata</u> (Quelch)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona</u> (<u>Polystra</u>) <u>venosa</u> Ehrenberg	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona</u> (<u>Pseudocolumnastraea</u>) <u>pollicata</u> Wells	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona</u> (<u>Polystra</u>) (<u>Encrusting</u>) sp. 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pavona</u> (<u>Explanata</u>) sp. 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Leptoseris hawaiiensis</u> Vaughan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Leptoseris incrustans</u> (Quelch)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Leptoseris myctoserooides</u> Wells	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Pachyseris speciosa</u> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FAMILY - SIDERASTRETIIDAE																
<u>Coscinaraea columnata</u> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 21. continued

FOUHA BAY STATIONS										YLIQ BAY STATIONS						
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
CORALS																
FAMILY - FUNGIDAE																
<i>Fungia</i> (<i>Verrillofungia</i>) <i>concinna</i> Verrill																
<i>Fungia</i> (<i>Fungia</i>) <i>fungites</i> (Linnaeus)																
<i>Fungia</i> (<i>Pleuractis</i>) <i>scoutaria</i> (Lamarck)																
FAMILY - PORITIDAE																
<i>Goniopora arbuscula</i> Umbgrove																
<i>Goniopora columnata</i> Dana																
<i>Goniopora lobata</i> Milne-Edwards and Haime																
<i>Goniopora tenuidens</i> (Quelch)																
<i>Porites andrewsi</i> Vaughan																
<i>Porites annae</i> Crossland																
<i>Porites australiensis</i> Vaughan																
<i>Porites lutea</i> Milne-Edwards and Haime																
<i>Porites lobata</i> Dana																
<i>Porites muricensis</i> Vaughan																
<i>Porites lichenoides</i> Dana																
<i>Porites mordax</i> Dana																
<i>Porites superifusa</i> Gardiner																
<i>Porites</i> (<i>Synaraea</i>) <i>convexa</i> Verrill																
<i>Porites</i> (<i>Synaraea</i>) <i>horizontalata</i> Hoffmeister																
<i>Porites</i> (<i>Synaraea</i>) <i>iwayamaensis</i> Eguchi																
<i>Porites</i> (<i>Synaraea</i>) <i>monticulosa</i> (Dana)																
<i>Porites</i> (<i>Synaraea</i>) <i>vaughani</i> Crossland																
<i>Alveopora</i> (Explanate sp. 1)																
SUBORDER - FAVINA																
FAMILY - FAVIDAE																
<i>Favia favus</i> (Forskaal)																
<i>Favia matthai</i> Vaughan																
<i>Favia pallida</i> (Dana)																
<i>Favia rotulosa</i> (Ellis and Solander)																
<i>Favia rotundata</i> (Gardiner)																
<i>Favia russelli</i> (Wells)																

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
<i>Favia speciosa</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Favia stelligera</i> (Dana)	-X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Favites abdita</i> (Ellis and Solander)	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X
<i>Favites flexuosa</i> (Dana)	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X
<i>Favites viridis</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Oulophyllia crispa</i> (Lamarck)	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X
<i>Goniastrea edwardsii</i> Chevalier	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Goniastrea pectinata</i> (Ehrenberg)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Goniastrea retiformis</i> (Lamarck)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Platygyra daedalea</i> (Ellis and Solander)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Platygyra pilini</i> Chevalier	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Leptoria phrygia</i> (Ellis and Solander)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Hydnophora microcosmos</i> (Lamarck)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Plesiastrea versipora</i> (Lamarck)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Montastraea curta</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Diploastrea heliopora</i> (Lamarck)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Leptastrea bottae</i> (Milne-Edwards and Haime)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Leptastrea immersa</i> Klunzinger	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Leptastrea purpurea</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Lentastrea transversa</i> (Klunzinger)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Cyphastrea myriophthalma</i> (Lamarck)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Cyphastrea serialia</i> (Forskaal)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Cyphastrea</i> (Encrusting sp.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Echinopora lamellosa</i> (Esper)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FAMILY - OCULINIDAE																
<i>Galaxea clavus</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Galaxea fascicularis</i> (Linnaeus)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Astroelia horrescens</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
FAMILY - MUSSIDAE																
<i>Lobophyllia corymbosa</i> (Forskaal)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Lobophyllia costata</i> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Lobophyllia hemprichi</i> (Ehrenberg)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Sympillia valenciennesii</i> Milne-Edwards & Haime	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIQ BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
<u>Acanthastrea echinata</u> (Dana)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<u>Acanthastrea hilliae</u> Wells																
FAMILY - PECTINIDAE																
<u>Echinophyllia aspera</u> (Ellis and Solander) <u>Mycedium</u> (Explorante sp. 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SUBORDER - CARYOPHYLLINA																
FAMILY - CARYOPHYLLIIDAE																
<u>Euphyllia glabrescens</u> (Chamisso and Eysenhardt) <u>Euphyllia</u> (Ramosé sp. 1) <u>Plerogyra sinuosa</u> (Dana) <u>Desmophyllum</u> (Solitary sp. 1) <u>Polycaulus verrilli</u> Duncan	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SUBORDER - DENDROPHYLLINA																
FAMILY - DENDROPHYLLIIDAE																
<u>Turbinaria</u> (Foliaceous sp. 1)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ORDER - CORNOTHECIALIA																
FAMILY - HELIOPORIDAE																
<u>Heliopora coerulea</u> (Pallas)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CLASS - HYDROZOA																
ORDER - MILLEPORINA																
FAMILY - MILLEPORIDAE																
<u>Millepora dichotoma</u> Forskaal <u>Millepora foveolata</u> Crossland <u>Millepora platiphylla</u> Hemprich & Ehrenberg	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Table 21. continued

CORALS	FOUHA BAY STATIONS								YLIG BAY STATIONS							
	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4	N-1	N-2	N-3	N-4	S-1	S-2	S-3	S-4
ORDER - STYLASTERINA FAMILY - STYLASTERIDAE				X				X			X		X			X
<u><i>Distichopora</i></u> sp. 1																
TOTAL GENERA FOR STATIONS	2	17	40	42	3	18	32	35	3	16	34	38	6	17	31	38
TOTAL SPECIES FOR STATIONS	2	39	116	142	3	40	89	104	3	38	94	127	6	42	85	112
TOTAL GENERA - FOUHA	46															
TOTAL SPECIES - FOUHA	155															
YLIG	44															
YLIG	159															

Table 22. Coral frequency, density, and percent of substrate coverage at Fouha Bay sediment stations N-1 through N-4 and S-1 through S-4.
Asterisks (*) indicate that coral frequency and density data were not collected.

		CHANNEL MARGIN		UPPER SLOPE		LOWER SLOPE		CHANNEL FLOOR	
		Frequency	Density	Frequency	Density	Frequency	Density	Frequency	Density
FOUHA BAY - STATION N-1		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)	
<u>Porites lutea</u>	No Corals Encountered	.05	.66	.32	.07	.45	.58	No Corals Encountered	
Totals				.66	.32	.07	.45	.58	
FOUHA BAY - STATION N-2		(20 Quadrats)		(16 Quadrats)		(11 Quadrats)		(16 Quadrats)	
<u>Cyphastrea serailia</u>	No Corals Encountered	.06	.39	.89	.07	.57	.37		
<u>Pavona (P.) obtusata</u>	No Corals Encountered	.25	1.56	4.34	.14	1.14	3.71	.13	1.17
<u>Porites lutea</u>					.07	.57	.37	.06	.39
<u>Porites (S.) vaughani</u>								.06	.39
<u>Psammocora</u> (massive sp. 2)								.06	.39
<u>Psammocora</u> (Encrusting sp. 1)								.06	.39
Totals				1.95	5.23	2.85	7.60	2.34	6.00
FOUHA BAY - STATION N-3		(20 Quadrats)		(20 Quadrats)		(10 Quadrats)		(32 Quadrats)	
<u>Acanthastrea echinata</u>		.05	.31	.10	.05	.31	1.53		
<u>Asarcicella</u>					.10	.63	.71	*	.07
<u>Cyphastrea serailia</u>								.10	
<u>Favia pallida</u>		.10	.63	.51	.05	.31	.20		
<u>Favia russelli</u>									
<u>Galaxea fascicularis</u>		.05	.31	.10					
<u>Goniastrea edwardsi</u>		.05	.31	.10					
<u>Goniastrea retiformis</u>		.20	1.88	3.67					
<u>Leptastrea purpurea</u>		.20	1.56	1.44					
<u>Leptoseris incrustans</u>					*	*		.07	
<u>Millepora dichotoma</u>								.12	
<u>Millepora foveolata</u>								*	

Table 22. continued

STATION N-3	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
<u>Montipora elschneri</u>	.05	.31	.20									
<u>Montipora foveolata</u>	.05	.31	.61									
<u>Montipora hoffmeisteri</u>												
<u>Montipora verrilli</u>	.05	.31	1.44	.05	.15	1.56	.1.33			*	*	.07
<u>Montipora</u> (Tuberculate sp. 1)												
<u>Pavona</u> (F.) <u>venosa</u>	.05	.31	.10	.10	.63	2.35				*	*	.01
<u>Platygyra</u> <u>pini</u>												
<u>Pocillopora</u> <u>damicornis</u>	.05	.31	.10	.25	1.56	7.65						
<u>Pocillopora</u> <u>dauae</u>												
<u>Porites</u> (S.) <u>convexa</u>												
<u>Porites</u> (S.) <u>iwayamaensis</u>	.05	.31	.10	.05	.10	.63	2.24					
<u>Porites</u> <u>lobata</u>	.10	.63	2.35	.10	.10	1.24						
<u>Porites</u> <u>lutea</u>												
<u>Porites</u> (S.) <u>vaughani</u>												
<u>Psammocora</u> <u>contigua</u>	.10	.63	.20	.20	.10	1.56						
<u>Psammocora</u> (Encrusting sp. 1)												
<u>Stylophora</u> <u>mordax</u>												
Totals		8.12	11.02		9.69	28.47				43.59		4.49
FOUHA BAY - STATION N-4			(20 Quadrats)	(20 Quadrats)			(35 Quadrats)			(32 Quadrats)		
<u>Acanthastrea</u> <u>echinata</u>												
<u>Acanthastrea</u> <u>hilae</u>												
<u>Acropora</u> <u>humilis</u>	.05	.31	.31									
<u>Acropora</u> <u>irregularis</u>	.05	.31	.10									
<u>Acropora</u> <u>nasuta</u>	.15	1.25	.71									
<u>Acropora</u> <u>surculosa</u>	.10	1.26	.51	.20	1.25	1.22						
<u>Acropora</u> <u>wardi</u>	.15	.94	.41	.05	.31	.31						
<u>Acropora</u> (Corymbose sp. 1)	.05	.31	.51	.05	.31	.31						
<u>Astreopora</u> <u>myriophthalma</u>												
<u>Cyphastrea</u> <u>seradilla</u>												
<u>Diplastrea</u> <u>heliopora</u>	.05	.31	.20									

No Corals Encountered

Table 22. continued

STATION N-4	continued	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
		Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
<i>Favia favus</i>		.05	.31	.10	.05	.31	.20	*	*	*			
<i>Favia pallida</i>					.10	.63	.41						
<i>Favia forrunana</i>		.05	.31	.10	.05	.31	.10						
<i>Favia russelli</i>					.05	.31	.10						
<i>Galaxea fascicularis</i>													
<i>Goniastrea edwardsii</i>		.20	1.57	1.54	.10	.63	.61						
<i>Goniastrea retiformis</i>		.05	.31	.10	.15	.94	1.54						
<i>Leptastrea purpurea</i>					.15	1.56	.71						
<i>Leptastrea transversa</i>					.05	.31	1.22						
<i>Leptoria phrygia</i>		.10	.63	.20									
<i>Leptoseris incrassata</i>													
<i>Dolophyllia costata</i>													
<i>Millepora platyphylla</i>													
<i>Montipora elschneri</i>													
<i>Montipora foveolata</i>													
<i>Montipora hoffmeisteri</i>													
<i>Montipora tuberculosa</i>													
<i>Montipora verrilli</i>													
<i>Pavona (P.) venosa</i>													
<i>Platygyra daedalea</i>													
<i>Pocillopora damicornis</i>													
<i>Pocillopora danae</i>		.05	.31	.10									
<i>Pocillopora meandrina</i>		.05	.31	.10									
<i>Pocillopora setchelli</i>		.20	1.56	.83	.05	.31	.10						
<i>Porites (S.) convexa</i>		.05	.31	.10	.05	.31	.41	*	*	*	44.24		
<i>Porites lobata</i>		.15	.94	.61	.25	1.88	4.70	*	*	*	.94		
<i>Porites lutea</i>		.10	.94	.31	.05	.31	1.02				.62		
<i>Porites murrayensis</i>													
<i>Psammocora contigua</i>													
<i>Stylocoenella armata</i>													
<i>Sylophora mordax</i>													
Totals		12.19	6.84	17.50	25.92						48.66		

Table 22. continued

FOUHA BAY - STATION S-1		CHANNEL MARGIN		UPPER SLOPE		LOWER SLOPE		CHANNEL FLOOR	
		Frequency	Coverage	Frequency	Coverage	Frequency	Coverage	Frequency	Coverage
<i>Pocillopora damicornis</i>									
<i>Porites lutea</i>									
Totals									
FOUHA BAY - STATION S-2		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)	
<i>Agariciella</i>									
<i>Cyphastrea serialia</i>									
<i>Favia pallida</i>	.05	.31	.20	.05	.31	.10	.05	.31	.51
<i>Leptoseris incrassata</i>									
<i>Montipora hoffmeisteri</i>									
<i>Montipora tuberculosa</i>									
<i>Montipora verrilli</i>									
<i>Montipora</i> (orange polyp)									
<i>Pavona</i> (P.) <i>obtusata</i>									
<i>Pavona</i> (P.) <i>venosa</i>									
<i>Pocillopora damicornis</i>									
<i>Porites lutea</i>	.20	.219	2.25	.20	1.88	3.27	.15	.94	1.33
<i>Porites</i> (S.) <i>vauhanii</i>									
<i>Psammocora</i> (Encrusting sp. 1)									
<i>Stylophora mordax</i>									
Totals		2.50	2.45		7.50	16.21	3.44	3.16	
FOUHA BAY - STATION S-3		(20 Quadrats)		(20 Quadrats)		(25 Quadrats)		(15 Quadrats)	
<i>Acropora wardi</i>									
<i>Cyphastrea serialia</i>									
<i>Goniastrea retiformis</i>									
<i>Lepastrea purpurea</i>									
<i>Montipora elschneri</i>									
<i>Montipora hoffmeisteri</i>									
<i>Montipora socialis</i>									
<i>Montipora tuberculosa</i>									
No Corals Encountered									

Table 22. continued

STATION S-3	continued	CHANNEL MARGIN		UPPER SLOPE		LOWER SLOPE		CHANNEL FLOOR	
		Density	Frequency	Density	Frequency	Density	Frequency	Density	Frequency
<i>Montipora verrilli</i>									
<i>Montipora</i> (Tuberculate sp. 1)		.05	.31	2.24	.04	.31	* * * *	11.17	-
<i>Pavona</i> (P.) <i>obtusata</i>		.05	.31	.20	.05	.31	* * * *	5.28	-
<i>Pavona</i> (P.) <i>venosa</i>								1.70	
<i>Pavona</i> (Explanate sp. 1)								.10	
<i>Pocillopora elegans</i>									
<i>Porites australiensis</i>		.05	.31	.10	.05	.31	* * *	.47	
<i>Porites</i> (S.) <i>convexa</i>									
<i>Porites</i> (S.) <i>horizontalata</i>		.05	.31	.20	.10	.63	* * *	10.65	
<i>Porites</i> (S.) <i>iwayamaensis</i>		.05	.31	.31	.05	.31	* * *	.88	
<i>Porites lobata</i>		.30	2.20	8.28	.25	1.87	* * *		
<i>Porites lutea</i>									
<i>Porites</i> (S.) <i>Vaughani</i>									
<i>Pseammocora contigua</i>		.10	.94	.31	.10	.63	* * *	.98	No Corals Encountered
<i>Pseammocora</i> (Erectrusting sp. 1)									
<i>Stylococnella armata</i>									
Totals		5.94	12.35	(20 Quadrats)	(20 Quadrats)	6.25	16.12	51.65	(15 Quadrats)
<hr/> FOUHA BAY - STATION S-4 <hr/>									
<i>Acropora surculosa</i>		.10	.63	.61	.05	.31	.41		
<i>Acropora wardi</i>		.10	.63	.71					
<i>Cyphastrea myriophthalma</i>		.05	.31	.20	.05	.31	* * *	.04	
<i>Echinopora lamellosa</i>								.16	
<i>Favia pallida</i>		.05	.31	.20	.10	.63	* * *	.78	
<i>Favia rotunda</i>		.05	.31	.10	.05	.31	* * *	.02	
<i>Favia russelli</i>		.05	.31	.10	.20	.10	* * *		
<i>Goniastrea edwardsi</i>		.05	.31	.20	.15	.94	* * *		
<i>Goniastrea retiformis</i>		.15							
<i>Hydnophora microconos</i>		.05	.31	.20					
<i>Leptastrea purpurea</i>		.05	.31	.10	.15	.94	* * *		
<i>Leptastrea transversa</i>		.05	.31	.20	.05	.31	.71		

Table 22. continued

STATION S-4	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
<i>Lobophyllia corymbosa</i>	.05	.31	*.41									
<i>Lobophyllia hemprichii</i>	.05	.31	1.74									
<i>Millepora Platiphylla</i>	.10	.63	.41									
<i>Millepora foveolata</i>	.10	.63	1.94									
<i>Montipora Eischneri</i>												
<i>Montipora foveolata</i>	.05	.31	.31	.05	.31	1.02	*	*	*			
<i>Montipora hoffmeisteri</i>	.05	.31	.10									
<i>Montipora tuberculosa</i>	.05	.31	1.85	.05	.31	.92	*	*	*			
<i>Montipora verrilli</i>	.05	.31	.10	.20	1.56	4.70	*	*	*			
<i>Montipora</i> (Tuberculate sp. 1)												
<i>Platygyra daedalea</i>	.15	.94	.61	.05	.31	.10						
<i>Platygyra plana</i>	.05	.31	.20									
<i>Pocillopora damicornis</i>												
<i>Pocillopora verrucosa</i>												
<i>Porites</i> (S.) <u>convexa</u>	.05	.31	.10	.63	.92							
<i>Porites lobata</i>	.55	3.45	4.82	.15	.94	.31						
<i>Porites lutea</i>	.05	.31	.41	.25	2.50	6.02	*	*	*			
<i>Psammocora</i> (Encrusting sp. 1)				.05	.31	.61	*	*	*			
<i>Stylocoenella armata</i>	.10	.63	.51	.05	.31	.31	*	*	*			
<i>Stylophora mollida</i>												
<i>Turbinaria</i> sp. 1												
Totals	13.75	16.84		11.56	18.06					18.11		
No Corals Encountered												

Table 23. Coral frequency, density, and percent of substrate coverage at Ylig Bay sediment stations N-1 through N-4 and S-1 through S-4.
 Asterisks (*) indicate that coral frequency and density data were not collected.

YLIG BAY - STATION N-1		YLIG BAY - STATION N-2		YLIG BAY - STATION N-3		CHANNEL FLOOR	
		(20 Quadrats)	(33 Quadrats)	(32 Quadrats)	(35 Quadrats)	(15 Quadrats)	(30 Quadrats)
		Prevalence Density	Prevalence Coverage	Prevalence Density	Prevalence Coverage	Prevalence Density	Prevalence Coverage
<u>Porites lutea</u>		No Corals Encountered	No Corals Encountered	No Corals Encountered	*	*	.01
Totals							
<u>Favia pallida</u>							
<u>Goniastrea retiformis</u>							
<u>Leptastrea purpurea</u>							
<u>Montipora lobulata</u>							
<u>Montipora verrilli</u>							
<u>Montipora (Tuberculate sp. 1)</u>							
<u>Pocillopora damicornis</u>							
<u>Pocillopora setchelli</u>							
<u>Porites lutea</u>							
Totals							
<u>Acropora irregularis</u>							
<u>Favia favus</u>							
<u>Favia pallida</u>	.03	.20	.26	.09	.54	.41	*
<u>Goniastrea retiformis</u>							
<u>Goniopora (Large Lobate)</u>	.03	.18	1.75	.09	.54	2.39	*
<u>Leptastrea purpurea</u>							
<u>Leptastrea transversa</u>							
<u>Montipora hoffmeisteri</u>							
<u>Montipora verrilli</u>							
<u>Montipora verrucosa</u>							
<u>Montipora simensis</u>							
<u>Montipora (Spilliate sp. 1)</u>							
<u>Montipora (Tuberculate sp. 1)</u>							

Table 23 • continued

	CHANNEL MARGIN	UPPER SLOPE	LOWER SLOPE	CHANNEL FLOOR	
				Frequency	Density
STATION N-3 continued.					
<i>Pavona</i> (<i>P.</i>) <i>obtusata</i>					
<i>Pavona</i> (<i>P.</i>) <i>venosa</i>					
<i>Pocillopora damicornis</i>		.03	.18	.52	.42
<i>Pocillopora setchelli</i>		.06	.36	* .35	.04
<i>Porites lutea</i>		.09	.54	* .35	
<i>Psammocora</i> (Encrusting sp. 1)					No Corals Encountered
Totals		.03	.20	2.93	.25
YLIG BAY - STATION N-4					
	(45 Quadrats)	(26 Quadrats)	(16 Quadrats)	(16 Quadrats)	(16 Quadrats)
<i>Acropora irregularis</i>					
<i>Cyphastrea</i> (Encrusting sp. 1)					
<i>Favia matthai</i>		.04	.28	.23	.04
<i>Favia pallida</i>				.04	.24
<i>Favia rotundata</i>				.08	.48
<i>Favia russelli</i>		.02	.14	.09	.04
<i>Favia speciosa</i>		.02	.14	.32	.24
<i>Galaxea fascicularis</i>					
<i>Constancea retiformis</i>					
<i>Goniopora tenuidens</i>		.04	.28	.23	
<i>Heliopora coerulea</i>					
<i>Hydnophora microcosma</i>					
<i>Leptastrea purpurea</i>					
<i>Lepidoseris mycetisserioides</i>					
<i>Mervilla ampliata</i>					
<i>Montipora ehrenbergii</i>					
<i>Montipora lobulata</i>					
<i>Montipora verrilli</i>					
<i>Montipora verrucosa</i>					
<i>Montipora</i> (Glabrous sp. 1)					
<i>Pavona minuta</i>					
<i>Pavona</i> (?) <i>obtusata</i>					
<i>Pocillopora meandrina</i>					
Totals		.04	.28	.14	.40

Table 23. continued

STATION N-4	continued	CHANNEL FLOOR									
		CHANNEL MARGIN		UPPER SLOPE		LOWER SLOPE		DENSITY		PERCENT COVERAGE	
Frequency	Density	Frequency	Density	Frequency	Density	Frequency	Density	Frequency	Density	Frequency	Density
Pocillopora setchelli	.02	.14	.05	.04	.24	.24	*	*	*	.07	
Plerogyra sinuosa							*	*	*	.05	
Porites (S.) horizontalata				.08	.48	.94	*	*	*	.17	
Porites (S.) iwayamensis				.15	2.87	4.40	*	*	*	12.62	
Porites lutea	.11	1.38	1.49				*	*	*	4.90	
Psammocora (Encrusting sp. 1)							*	*	*	.01	
Stylocoeniella armata	.02	.14	.05	.04	.24	.09					
Totals	4.03	4.92		9.38	22.13					25.28	1.56
YLIG BAY - STATION S-1		(20 Quadrats)		(20 Quadrats)		(40 Quadrats)		(40 Quadrats)		(40 Quadrats)	
Porites lutea		No Corals Encountered		.05	.31	1.22	No Corals Encountered			No Corals Encountered	
Totals				.31	1.22						
YLIG BAY - STATION S-2		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)		(20 Quadrats)	
Favia favus				.05	.31	.61	.05	.31	.10	.05	.31
Favia pallida				.05	.31	.10	.10	.63	.20	.05	.31
Goniastrea retiformis	.05	.31	.10	.10	.63	.71	.10	.63	1.33	.05	.31
Montipora hofmeisteri				.15	.94	2.35	.05	.31	.71	.05	.31
Montipora lobulata				.10	.63	1.33					.71
Montipora verrilli											
Montipora (tuberculate sp. 1)											
Pocillopora damicornis	.05	.31	.10	.05	.31	.61	.05	.31	.20	.05	.31
Porites lutea	.05	.31	.20	.10	.63	2.24	.15	.94	2.35	.05	.31
Psammocora contigua		.10									
Totals	1.24	.50	3.76	7.95			3.44	4.99		1.24	1.42

Table 23 • continued

	CHANNEL MARGIN (32 Quadrats.)	UPPER SLOPE (32 Quadrats.)		LOWER SLOPE (16 Quadrats.)		CHANNEL FLOOR (8 Quadrats)	
		Density	Frequency	Density	Frequency	Density	Frequency
YLIG RAY - STATION S-3							
<u>Acanthastrea echinata</u>	No Corals Encountered	.06	.39	.57	*	*	.89
<u>Acropora wardi</u>		.03	.20	.06	*	*	.27
<u>Alveopora</u> (Explanate sp. 1)							.15
<u>Favia favus</u>		.03	.20	.06	*	*	1.16
<u>Favia pallida</u>							.93
<u>Favia speciosa</u>							.54
<u>Favia stelligera</u>							
<u>Goniastrea edwardsi</u>		.22	1.76	4.59	*	*	
<u>Goniastrea retiformis</u>							.91
<u>Hydnophora microconos</u>		.03	.20	.38	*	*	.37
<u>Leptastrea purpurea</u>							.89
<u>Leptoria phrygia</u>							3.54
<u>Montipora hoffmeisteri</u>		.06	.59	.77	*	*	
<u>Montipora lobulata</u>		.13	.98	3.44	*	*	10.21
<u>Montipora verrilli</u>							2.21
<u>Montipora verrucosa</u>							
<u>Montipora</u> (Pilliate sp. 2)		.06	.39	3.32	*	*	
<u>Montipora</u> (Tuberculate sp. 1)							1.75
<u>Pocillopora damicornis</u>		.03	.20	.38	*	*	.05
<u>Pocillopora setchelli</u>		.03	.20	3.13	*	*	
<u>Porites lutea</u>		.03	.20	.13			
<u>Stylocoeniella armata</u>							
Totals				5.27	16.83	23.87	(8 Quadrats)
YLIG BAY - STATION S-4							
	(29 Quadrats)	(37 Quadrats)		(16 Quadrats)		(8 Quadrats)	
<u>Acanthastrea echinata</u>							No Corals Encountered
<u>Acropora irregularis</u>		.03	.22	.21	.05	.34	.17
<u>Acropora nana</u>					.05	.34	
<u>Acropora surculosa</u>		.03	.22	.35	.03	.17	.17
<u>Acropora wardi</u>		.03	.22	.07	.17	.50	*
<u>Alveopora</u> (Explanate sp. 1)							1.22
<u>Favia stelligera</u>							

Table 23. continued

	STATION S-4 continued	CHANNEL MARGIN			UPPER SLOPE			LOWER SLOPE			CHANNEL FLOOR		
		Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage	Frequency	Density	Percent Coverage
	<u>Goniastrea edwardsi</u>	.10	.63	2.32	.03	.17	.06	*	*	1.02			
	<u>Goniastrea retiformis</u>							*	*	1.34			
	<u>Hydnophora microconos</u>	.03	.22	.21	.03	.17	.11						
	<u>Leptastrea purpurea</u>												
	<u>Leptastrea transversa</u>												
	<u>Leptoria phrygia</u>	.14	1.07	2.26	.05	.34	.77	*	*	16.36			
	<u>Montastrea curta</u>												
	<u>Montipora lobulata</u>												
	<u>Montipora verrilli</u>												
	<u>Montipora (Papillate sp. 2)</u>												
	<u>Montipora (Papillate sp. 1)</u>												
	<u>Pavona varians</u>												
	<u>Platygyra pini</u>												
	<u>Pocillopora brevicornis</u>												
	<u>Pocillopora eydouxi</u>												
	<u>Pocillopora meandrina</u>												
	<u>Pocillopora setchelli</u>												
	<u>Porites superflua</u>												
	<u>Porites (S.) vaughani</u>												
	<u>Stylocoeniella armata</u>												
	Totals	4.53	5.98					6.76	12.25				
													33.80

Table 24. Size distribution of corals at Fouha Bay Stations N-1 through N-4 and S-1 through S-4.

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR				
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	
Fouha Bay - Station N-1																	
Pavona divaricata	4	6.5	3.7	3-11	1	8.0	-	-	1	8.0	-	-	1	6.7	2.9	6-8	
<u>Porites lutea</u>																	
TOTALS	4	6.5	3.7	3-11	1	8.0	-	-	1	8.0	-	-	1	5.0	-	-	
Fouha Bay - Station N-2																	
Acropora (Corymbose sp. 1)					1	15.0	-	-	1	8.0	-	-	1	5.0	-	-	
<u>Astreopora myriophthalma</u>																	
Cyphastrea serialia																	
Favia pallida					1	6.0	-	-	1	4.0	-	-	1	5.0	-	-	
Favia russelli					1	6.0	-	-	1	4.0	-	-	1	3.0	-	-	
Goniastrea retiformis					1	6.0	-	-	1	8.0	-	-	1	8.0	-	-	
Leptastrea purpurea					1	6.0	-	-	1	8.0	-	-	1	29.0	-	-	
Leptastrea transversa																	
Lobophyllia costata																	
Millepora platyphylla																	
Millepora verrucosa																	
Montipora acanthella																	
Montipora elschneri																	
Montipora hoffmeisteri																	
Montipora verrilli																	
Montipora (Tuberculate sp. 1)																	
Montipora (Tuberculate sp. 2)																	
Pavona decussata																	
Pavona divaricata																	
Pavona (P.) obtusata																	
Pavona (P.) (Encrusting sp. 1)																	
Pocillopora damicornis																	
Porites australiensis																	
Porites lutea																	
Porites (S.) vaughani																	
Psammocora (Encrusting sp. 1)																	
Psammocora (Massive sp. 2)																	
Stylophora mordax																	
TOTALS	4	4.3	2.6	2-8	10	16.54	22.0	3-75	17	17.9	11.2	3-38	11	20.9	25.6	3-75	

Table 24. continued

	CHANNEL MARGIN								CHANNEL FLOOR							
	n	s	w	d	n	s	w	d	n	s	w	d	n	s	w	
Fouha Bay - Station N-3	8	7.1	2.6	4-12	1	12.0	-	-	8	31.6	-	-	-	-	-	
<i>Acanthastrea echinata</i>					1				1							
<i>Acanthastrea hilliae</i>					1				1							
<i>Acropora hystrix</i>					1				1							
<i>Acropora humilis</i>	7	6.6	3.9	-	2	11.5	0.7	11-12	2	20.5	13.4	11-12	22-28	-	-	
<i>Acropora nasuta</i>	1	8.0	-	-	2	20.5	17.5	11-12	2	37.6	17.5	11-30	25-250	1	85.0	-
<i>Acropora surculosa</i>					1	200.0	-	-	1				2	77.5	60.1	35-120
<i>Acropora wardii</i>					3	20.3	8.7	13-30	1	40.0	-	6	8.0	3.2	3.5-13	
<i>Agariciella planulata</i>					1	40.0	-	-	2	5.0	1.4	4-6	7	7.9	5.9	1-15.3
<i>Alveopora</i> (Explanate sp. 1)	7	6.4	2.9	3-11	5	8.0	3.4	4-13	2			-	1	8.9	-	-
<i>Coscinateca columnata</i>	2	3.5	0.7	3-4	2	15.0	4.2	12-18	2			-				
<i>Cyphastrea myriophthalma</i>	4	5.7	1.2	4-6.8	2	13.5	2.1	12-15	2			-				
<i>Echinopora lamellosa</i>	2	7.9	1.3	7-8.8	2	34.0	22.6	18-50	1			-				
<i>Favia favus</i>	13	13.8	8.1	2-32	3	20.7	10.3	12-32	1			-				
<i>Favia pallida</i>	9	5.5	4.8	2.8-18.2	3	23.3	7.6	18-32	1			-				
<i>Favia russelli</i>	7	11.3	6.1	3.5-22	3				1	50.0	3.8	5-12	14	5.6	5.1	1.5-21.2
<i>Galaxea fascicularis</i>					1	50.0	-	-	6	12.2	8.7	4-28	7	9.5	5.2	4.2-18.2
<i>Goniastrea edwardsi</i>					1				1			-	2	38.3	8.1	32.5-
<i>Goniastrea decinata</i>					1				1			-				
<i>Coniastrea retiformis</i>					1				1			-				
<i>Leptastrea purpurea</i>					1				1			-				
<i>Leptoria phrygia</i>					1				1			-				
<i>Leptoseris incrustans</i>					1				1			-				
<i>Leptoseris mycesoseroides</i>					1				1			-				
<i>Lobophyllia costata</i>					1				1			-				
<i>Millepora dichotoma</i>					1				1			-				
<i>Millepora platyphylla</i>	2	125.0	7.1	120-130	1	8.0	-	-	2	100.0	0.0	100-100				
<i>Montastraea curta</i>	4	7.6	3.1	4.6-11	1			-	5	4.3	3-12	2				
<i>Montipora elschneri</i>	5	7.6	4.3	3.8-55.9	2			-	3	15.6	33.8-55.9	2				
<i>Montipora loveolata</i>	3	44.9	15.6		2			-	2	32.0	11.3	24-40				
<i>Montipora hoffmeisteri</i>	2	20.0	18.5	6.9-33	5	12.8	11.2	4-32	1	35.0	-	-	2	12.3	7.9	6.7-17
<i>Montipora verrilli</i>					1			-	1	25.0	-	-				
<i>Montipora</i> (Tuberclitate sp. 1)																
<i>Montipora</i> (Glabrous sp. 1)																

Table 24. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR														
	n	L	13.0	-	S	W	n	L	10-12	S	W	n	L	59.0	S	W	n	L	56.0	S	W	n	L	19-86	S	W	n	L	45-100	S	W		
<i>Montipora</i> (Papillate sp. 1)	1	1.0	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pachyseris speciosa</i>	2	11.0	1.4	10-12	3	1.3	1	59.0	-	8.4	5-20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Polygyathus verrilli</i>	1	8.0	-	-	-	-	2	52.5	47.4	48.0	45-170	1	38.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona minutula</i>	1	3.0	-	-	-	-	3	64.0	34.2	32-100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona varians</i>	1	25.0	9.0	5.7	5-13	3	4.0	1.7	3-6	4.2	12-17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pavona (P.) obesusata</i>	1	-	-	-	-	-	1	19.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona (P.) pollicata</i>	1	-	-	-	-	-	1	30.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona (P.) vedosa</i>	1	-	-	-	-	-	1	16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Platygyra daedolea</i>	1	-	-	-	-	-	1	45.7	6.1	41.4-50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Platygyra pini</i>	1	-	-	-	-	-	1	97.5	31.8	75-120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pocillopora damicornis</i>	4	31.2	31.8	12.2-78.7	2	3-12	2	4.8	1.1	4-5.5	5	4.0	3.0	1.5-7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pocillopora danae</i>	7	5.1	3.2	2-55	5	69.1	74.2	23-200	2	101.1	117.2	18.2-184	22	17.4	24.0	3-113	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora setchelli</i>	11	18.3	15.2	-	-	5	98.6	74.0	24.5-200	20	70.3	87.2	2.4-290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pocillopora verrucosa</i>	-	-	-	-	-	-	1	63.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Pocillopora (Ramoze sp. 1)</i>	8	6.9	3.9	3-14.1	1	184.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Porites austroaustralis</i>	115	12.9	19.2	1-130	113	37.3	45.3	2-200	71	38.2	64.0	1-290	32	16.1	21.2	2-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Porites murrayensis</i>	TOTALS	N-4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fouha Bay - Station N-4	4	10.3	1.7	8-12	5	101.6	73.4	30-200	8	12.1	16.3	3-52	No Corals Encountered	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Acanthastrea echinata</i>	2	19.5	4.9	16-23	3	15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Acanthastrea hillae</i>	2	7.5	2.1	6-9	2	33.2	1.1	32.4-34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<i>Acropora humilis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Acropora hystrrix</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Acropora irregularis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Acropora kentii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table 24. continued'

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	s	w	e	n	s	w	e	n	s	w	e	n	s	w	e
<i>Acropora nana</i>	3	7.0	5.6	2-13												
<i>Acropora nasuta</i>	11	10.8	7.0	4-26.9	2	12.5	0.7	12-13								
<i>Acropora squarrosa</i>	8	6.8	2.1	4-11	5	9.8	3.1	7-15								
<i>Acropora surculosa</i>	4	7.0	1.4	6-9	1	11.0	-	-								
<i>Acropora wardii</i>	2	11.0	7.1	6-16	2	44.5	6.4	40-49								
<i>Acropora (Corymbose sp. 1)</i>																
<i>Agariciella planulata</i>																
<i>Alveopora</i> (Explanate sp. 1)																
<i>Astreopora myriophthalma</i>																
<i>Cyphastrea serilia</i>	1	4.6	-	-	1	52.7	-	-								
<i>Diplosastera heliopora</i>	2	36.0	19.9	21.9-50	2	5.5	0.7	5-6	7	7.0	3.3	2.2-12.6				
<i>Favia favus</i>	2	6.5	2.2	4.9-8	1	6.9	-	-	2	16.5	8.3	10.6-22.4				
<i>Favia pallida</i>	1	8.0	-	-	2	8.0	0.0	8-8	1	67.1	-	-				
<i>Favia rotumana</i>					1	10.0	-	-								
<i>Favia russelli</i>					1	6.0	-	-								
<i>Favia stelligera</i>					2	31.8	3.1	29.6-34								
<i>Pavites flexuosa</i>	1	29.0	-	-	1	37.0	-	-								
<i>Pavites virens</i>	1	7.0	-	-	2	13.3	1.0	12.6-14	2	60.0	14.1	50-70				
<i>Galaxea fascicularis</i>					1	50.0	-	-								
<i>Goniastrea edwardsi</i>					2	13.3	-	-								
<i>Goniastrea pectinata</i>	12	8.7	3.9	4.9-19	8	22.9	21.3	4-56								
<i>Goniastrea retiformis</i>	1	22.0	-	-												
<i>Conionopora arbustula</i>	1	12.0	-	-												
<i>Hydnophora microcenos</i>	1	6.0	-	-	6	6.2	2.4	4-10								
<i>Leptastrea purpurea</i>	1	12.0	-	12-19.2	1	38.7	-	-								
<i>Leptastrea transversa</i>	3	14.4	4.2													
<i>Leptoria phrygia</i>																
<i>Leptoseris incrustans</i>																
<i>Lobophyllia corymbosa</i>																
<i>Lobophyllia hemprichii</i>																
<i>Millepora platyphylla</i>																
<i>Montipora caliculata</i>																
<i>Montipora elischi</i>																
<i>Montipora foveolata</i>	3	26.7	7.6	20-35	2	33.0	14.9	22.4-43.5	2	11.6	0.6	11.2-12				
<i>Montipora hoffmeisteri</i>	1	30.4	-	-	2	57.8	38.3	30.7-84.9	-	4	19.3	6.8	12-28.3			

Table 24. continued

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR						
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	
<i>Montipora sinensis</i>	1	25.7	-	-	2	37.5	21.8	22-52.9	6	9.9	4.1	3.9-16.1													
<i>Montipora socialis</i>	1	100.0	-	-					17	9.6	6.7	1.7-23.3													
<i>Montipora tuberculosa</i>																									
<i>Montipora verrilli</i>	4	14.3	5.9	8-22	7	14.4	9.0	6-30	17	9.6	6.7	1.7-23.3													
<i>Montipora verrucosa</i>																									
<i>Montipora (Tuberculate sp. 1)</i>									3	31.7	27.8	10-63													
<i>Montipora (Tuberculate sp. 2)</i>									2	22.5	3.5	20-25													
<i>Montipora (Foveolate sp. 1)</i>									2	49.9	6.7	4.5-54.8													
<i>Pavona clavus</i>									1	100.0	-	-													
<i>Pavona (P.) obtusata</i>	2	12.9	2.6	11-14.7	1	15.5	-	-																	
<i>Pavona (P.) venosa</i>									3	18.5	6.9	14-26.4													
<i>Platygyra daedalea</i>									4	52.3	21.4	22-72	6	81.3	72.6	18-200									
<i>Platygyra pini</i>									1	6.0	-	-													
<i>Pocillopora damicornis</i>	1	8.0	-	-	2	10.3	5.0	11-17																	
<i>Pocillopora danae</i>	2	6.5	0.7	6-7	2	33.0	0.0	33-33																	
<i>Pocillopora elegans</i>									2	41.5	0.0	41.5-41.5													
<i>Pocillopora eydouxii</i>	1	16.2	-	-	2	41.5	0.0	-																	
<i>Pocillopora meandrina</i>	6	5.8	4.8	2-15	2	17.3	2.5	15.5-19																	
<i>Pocillopora setchelli</i>	5	6.9	2.2	4-9.8	2	27.3	4.6	22-30	1	30.0	-	-													
<i>Pocillopora verrucosa</i>									2	28.0	-	-													
<i>Pocillopora woodjonesi</i>									1	16.0	-	-													
<i>Pocillopora (Ramosa sp. 1)</i>	1	6.0	-	-	1	45.0	-	-																	
<i>Porites annae</i>																									
<i>Porites australiensis</i>	6	6.3	2.0	4.9-10	6	36.1	33.1	8-98.7	4	26.2	24.6	5.3-54.8													
<i>Porites lobata</i>	5	27.2	22.1	8-60	3	30.7	9.2	20-36																	
<i>Porites lutea</i>									1	38.9	-	-													
<i>Porites mordax</i>									1	28.3	-	-													
<i>Porites murrayensis</i>																									
<i>Porites (S.) convexa</i>	1	22.0	-	-	1	4.7	1.5	2-6																	
<i>Porites (S.) iwayamaensis</i>	1	22.0	-	-	1	4.0	-	-																	
<i>Porites (S.) taughani</i>	4	6.0	0.8	5-7	6	4.7	1.5	-																	
<i>Psammocora contigua</i>	7	6.6	6.3	2-20																					
<i>Stylocoenella armata</i>	3	2.3	0.6	2-3																					
<i>Stylophora mordax</i>	3	8.3	2.1	6-10	4	18.5	10.7	8-30																	
<i>Turbinaria (Explanate sp. 1)</i>									2	64.9	6.9	60-69.8	5	12.2	6.8	3-20									
TOTALS	121	11.8	12.2	2-100	147	31.7	29.5	2-200	87	27.3	53.3	1.7-390													

Table 24. continued'

FOUHA BAY - STATION S-1										FOUHA BAY - STATION S-2									
CHANNEL MARGIN					UPPER SLOPE					LOWER SLOPE					CHANNEL FLOOR				
n	\bar{Y}	s	w	n	n	\bar{Y}	s	w	n	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}
Pocillopora damicornis	1	4.0	-	-	5	6.4	3.0	3-10	3	5.3	1.2	4-6	2	2.5	0.7	-	2-3	-	
Porites lutea					2	15.0	9.9	8-22	7	41.3	23.5	8-71	-	-	-	-	-	-	-
Fsmocora (Encrusting sp. 1)									1	44.3	-								
TOTALS	1	4.0	-	-	7	8.9	6.3	3-22	11	31.8	24.9	4-71	2	2.5	0.7	-	2-3	-	
Acanthastrea hillae																			
Agariciella planulata	1	4.0	-	-	2	20.0	-	8-20.4											
Acropora nasuta									1	3.0	-								
Acropora wardii	3	12.7	8.5	4-21	1	12.0	-	-	1	18.0	-								
Cyphastrea serailia					1	22.0	-	-	1	16.0	-								
Echinopora lamellosa						1	7.0	-											
Euphyllia glabrescens																			
Favia pallida	1	8.0	-	-	2	10.0	4.2	7-13											
Favia russelli					2	6.0	2.8	4-8											
Favites virens					1	27.0	-	-											
Goniastrea retiformis	4	12.0	5.6	7-19	2	7.5	4.9	4-11	1	10.0	-					3	10.3	7.8	4-19
Lepastrea purpurea	4	5.0	2.2	3-8												4	5.5	2.6	3-9
Leptoria phrygia	1	9.0	-	-	1	7.0	-	-	5	6.0	2.0								
Leptoseris incrustans									1	11.0	-						4-8		
Montipora acanthella																			
Montipora elschneri						2	20.3	8.8	14.1-26.5										
Montipora hoffmeisteri						2	12.5	2.1	11-13.9	1	13.0	-							
Montipora tuberculosa						1	9.5	-	1	21.0	-								
Montipora verrilli						5	18.5	6.5	12-26.1	2	20.0	2.8				18-22	2	17.0	5.7
Montipora (Tuberculate sp. 1)	1	18.0	-	-					1	12.0	-								13-2
Pavona divaricata									1	16.2	-								
Pavona (P.) obtusata									3	21.3	3.1	18-24							
Pavona (P.) venosa						3	52.1	29.5	32-86			1	71.2	-					
Pocillopora damicornis						1	10.0	-	1	3.0	-	2	8.5	2.1				7-10	
Porites australiensis									3	8.7	3.1	6-12							
Porites lobata									1	6.0	-	1	4.0	-					
Porites lutea						6	30.1	36.3	4-78.8	8	53.8	75.0	5-200	5	23.2	27.9	4-70		
Porites (S.) convexa	13	23.7	22.0	8-93	1	130.0	-												

Table 24. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w
<u>Porites (S.) horizontalata</u>					1	25.3	-	-	1	41.0	-	-				
<u>Porites (S.) moniticolosa</u>	1	3.0	-		2	63.7	47.6	30-97.3	1	5.0	-	-				
<u>Porites (S.) vaughani</u>	2	3.5	0.7	3-4	2	19.5	19.1	6-33	2	4.5	2.1	3-6				
<u>Psammocora contigua</u>																
<u>Psammocora (Encrusting sp. 1)</u>																
<u>Stylocoeniella armata</u>																
<u>Styliophora mordax</u>																
TOTALS	31	15.0	16.4	3-93	4.3	24.2	27.8	3-130	37	21.4	38.1	3-200	20	15.3	20.0	3-71.2
Foula Bay - Station S-3																
<u>Acanthastrea echinata</u>	1	8.0	-						2	6.0	2.8	4-8				
<u>Acanthastrea hillae</u>									1	20.0	-	-				
<u>Agariciella planulata</u>	2	10.0	2.8	8-12					4	27.0	11.0	16-40				
<u>Acropora humilis</u>									1	6.0	-	-				
<u>Acropora hystrix</u>									1	8.0	-	-				
<u>Acropora nasuta</u>	1	13.0	-						3	9.3	3.1	6-12				
<u>Acropora surculosa</u>	2	7.0	1.4	6-8												
<u>Acropora wardii</u>																
<u>Coscinaraea columnaria</u>	1	32.5	-						1	8.0	-	-				
<u>Cyphastrea serilia</u>	1	14.0	-						1	13.0	-	-				
<u>Echinophyllia aspera</u>									1	41.5	-	-				
<u>Echinopora lanillosa</u>																
<u>Euphyllia glabrescens</u>	1	4.0	-						1	20.8	-	-				
<u>Favia matthai</u>	2	5.2	1.6	4-6.3					3	8.0	4.0	4-12				
<u>Favia pallida</u>	1	6.0	-						1	6.0	-	-				
<u>Favia setiforma</u>									1	27.0	-	-				
<u>Favites virens</u>	1	6.0	-						1	8.0	-	-				
<u>Galaxea fascicularis</u>	1	7.7	1.5	6-9					2	9.0	1.4	8-10				
<u>Coniastrea edwardsi</u>	3	10.9	9.5	4-29.9	4				1	15.3	6.4	8-22				
<u>Goniastrea retiformis</u>	6	5.7	-						3	6.3	4.9	3-12				
<u>Leptoseris purpurea</u>	1	27.3	-						1	41.0	-					
<u>Leptoseris transversa</u>																
<u>Leptoseris intricatus</u>																
<u>Leptoseris myctoserooides</u>																
<u>Leptoseris phrygia</u>	1	5.7	-						2	5.0	1.4	4-6				
									1	37.9	-	-				

Table 24. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR					
	n	s	w	z	n	s	w	z	n	s	w	z	n	s	w	z	n	s	w	z	n	s	w	z
<i>Millepora dichotoma</i>	1	5.0	-	-	1	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Millepora foveolata</i>					1	48.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Millepora platiphylla</i>	1	22.0	-	-	1	61.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Montipora elschneri</i>					1	40.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Montipora foveolata</i>					1	24.7	7.0	18-42	-	-	-	-	5	29.7	11.2	18-45.5	-	-	-	-	-	-	-	-
<i>Montipora hoffmeisteri</i>	1	18.0	-	-	1	24.0	-	-	-	-	-	-	2	24.5	1.8	23-25.7	-	-	-	-	-	-	-	-
<i>Montipora socialis</i>					1	-	-	-	-	-	-	-	2	29.8	10.3	22.5-37	-	-	-	-	-	-	-	-
<i>Montipora tuberculosa</i>					2	17.0	7.1	12-22	1	22.0	-	-	4	29.0	13.9	9.5-41.5	-	-	-	-	-	-	-	-
<i>Montipora verrilli</i>					1	14.0	-	-	8	32.2	22.3	14-80	-	-	-	-	2	17.4	0.1	17.3-17.5	-	-	-	-
<i>Montipora</i> (Papillate sp. 1)					1	32.0	-	-	1	120.0	-	-	10	50.7	33.9	20-87	-	-	-	-	-	-	-	-
<i>Pavona minuta</i>					1	10.2	-	-	1	24.5	12.0	-	7.2	7.2	3.0	3.7-12	-	-	-	-	-	-	-	-
<i>Pavona</i> (P.) obtusata					1	-	-	2	11.0	-	-	-	2	4.5	1.4	3.5-5.5	-	-	-	-	-	-	-	-
<i>Pavona</i> (P.) pollicata					1	6.0	-	-	2	160.7	27.3	141.4-180	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pavona</i> (P.) venosa					1	9.0	-	-	1	11.0	9.9	4-18	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pavona</i> (Explanata sp. 1)					1	-	-	-	2	13.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Playugra daedalea</i>					1	-	-	-	4	8.0	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Playugra pini</i>					1	-	-	-	3	9.0	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora damicornis</i>					1	-	-	-	1	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora danesi</i>					1	-	-	-	1	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora elegans</i>					1	-	-	-	1	20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora meandrina</i>					1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora setchelli</i>					1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora woodjonesi</i>					1	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora</i> (Ramosa sp. 1)					1	8.0	-	-	4	5.3	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites australiensis</i>	7	6.3	2.9	4-12	5-120	8	43.7	35.8	4-118	1	18.8	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites lobata</i>	9	50.7	40.2	-	3	69.6	56.4	29.7-109.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites lutea</i>	1	5.0	-	-	0	22.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites mordax</i>					1	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites murrayensis</i>					1	-	-	-	3	118	88.0	29-205	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites</i> (S.) convexa					3	3.8	2-8.9	5	22.3	17.4	-	7-42.4	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites</i> (S.) horizontalata					1	29.7	-	-	3	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites</i> (S.) iwayamaensis					3	6.3	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Porites</i> (S.) vaughani					3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Psammocora continua</i>					3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Psammocora</i> (Encrusting sp. 1)																								

Table 24. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR						
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	
<i>Stylocoenella armata</i>	1	4.0	-	-	1	13.0	-	-	2	3.7	0.3	3.5-3.9	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Stylophora mondax</i>	59	16.5	22.1	2-120	93	24.9	31.2	3-205	60	19.7	30.8	1.4-180	1	8.0	-	-	-	-	-	-	-	-	-	-	-
TOTALS	59																								
Foula Bay - Station S-4																									
<i>Acanthastrea echinata</i>																									
<i>Acropora humilis</i>	2	6.9	1.6	5.7-8	1	13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Acropora surculosa</i>	2	12.5	6.4	8-17	1	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Acropora wardii</i>	1	9.4	-	-	1	9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Cyphastrea myriophthalma</i>																									
<i>Cyphastrea serailia</i>																									
<i>Diplastrea heliopora</i>	1	42.0	-	-	1	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Echinophyllia aspera</i>																									
<i>Echinopora lamellosa</i>	2	6.0	1.4	5-7	10	7.2	4.0	2-14	11	5.8	5.6	2-21.9	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia favus</i>	5	9.6	5.5	4-18	-	1	12.0	-	-	1	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia pallida</i>	1	7.0	-	-	1	8-14	1	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia rotumana</i>	1	4.9	-	-	1	15-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia russelli</i>	1	11.3	3.1	-	1	8-14	1	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia stelligera</i>	1	16.2	-	-	1	15-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favites abdita</i>	2	16.5	2.1	-	1	15-18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favites flexuosa</i>	1	8.0	-	-	1	6-8	1	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Goniastrea edwardsi</i>	1	8.0	-	-	1	6-8	1	13.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Goniastrea pectinata</i>	1	7.0	1.0	-	1	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Goniastrea retiformis</i>	3	12.0	-	-	1	3	9.3	11.0	2-22	1	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Goniopora columnaria</i>	1	4.0	-	-	1	2	15.4	0.8	14.8-16	1	150.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hydnophora microconos</i>	1	12.4	-	-	1	16.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptastrea purpurea</i>	1	22.0	-	-	1	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptastrea transversa</i>	1	24.0	5.7	19.9-28	1	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptoria phrygia</i>	1	120.0	-	-	1	3-167	2	35.2	3.1	33-37.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptoseris mycetoseroides</i>	2	37.2	-	-	1	6-8.9	1	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lobophyllia cerymbose</i>	1	90.2	108.7	1.4-180	1	19.7	30.8	1.4-180	1	8.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lobophyllia costata</i>	1	7.5	2.1	-	1	6-8.9	1	17.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Lobophyllia hemprichii</i>	2																								
<i>Millepora foveolata</i>	2																								
<i>Millepora platiphylla</i>	2																								

Table 24. continued.

	CHANNEL MARGIN						LOWER SLOPE						UPPER SLOPE						CHANNEL FLOOR					
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w
<i>Montastraea curta</i>	1	8.2	-	-													4	11.6	4.1	6.7-16.2				
<i>Montipora elisabethae</i>	2	8.9	1.3	.8-9.8	2	22.0	0.0	22-22	-	1	28.6	-	-	-	-	-								
<i>Montipora foveolata</i>	1	92.0	-	-	1	39.0	-	-																
<i>Montipora Hoffmeisteri</i>	1	25.7	-	-	1	13.0	-	-																
<i>Montipora tuberculosa</i>	1	4.0	-	-	5	19.1	18.3	6-49.8	10	9.0	7.8	2.8-28.1												
<i>Montipora verrilli</i>	1	7.0	-	-																				
<i>Montipora verrucosa</i>																								
<i>Montipora (Tuberculate sp. 1)</i>																								
<i>Montipora (Tuberculate sp. 2)</i>																								
<i>Pavona (P.) obvoluta</i>																								
<i>Pavona (P.) venosa</i>	4	38.2	54.7	6.9-120	1	33.0	-	-																
<i>Platygyra daedalea</i>																								
<i>Platygyra pini</i>																								
<i>Plesiastrea versipora</i>																								
<i>Pocillopora damicornis</i>	1	6.0	-	-	1	8.0	-	-																
<i>Pocillopora danae</i>	1	6.4	-	-	1	6.0	-	-																
<i>Pocillopora elegans</i>	1	28.0	-	-	1	13.2	-	-																
<i>Pocillopora ligulata</i>																								
<i>Pocillopora meandrina</i>	2	17.5	6.4	13-22	1	24.8	-	-									1	23.5	-	-				
<i>Pocillopora verrucosa</i>																								
<i>Pocillopora woodjonesi</i>	1	4.5	-	-	2	18.8	0.8	18.2-19.3																
<i>Pocillopora (Ramosa sp. 1)</i>	1	4.0	-	-	3	5.3	1.2	4-6																
<i>Porites lobata</i>	12	19.4	13.8	6-50.2	14	42.2	36.7	2-120	20	16.3	18.2	1-50.3												
<i>Porites lutea</i>						2	72.0	93.3	6-138															
<i>Porites (S.) convexa</i>																								
<i>Psammocora (Encrusting sp. 1)</i>	1	8.5	-	-	1	20.8	-	-									8	2.8	1.0	1.6-4.2				
<i>Sclerocoenialla ornata</i>																								
<i>Styliophora mordax</i>	7	7.6	3.6	4-12	5	13.0	9.7	7-30	-	1	14.4	-	-											
<i>Turbinaria (Explanate sp. 1)</i>																								
TOTALS	76	18.7	27.6	4-167	93	20.2	24.2	2-138	63	14.2	24.1	1-150	1	28.0	-	-	-	-	-	-	-	-	-	-

Table 25. Size distribution of coral species at Ylig Bay Stations N-1 through N-4 and S-1 through S-4

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	\bar{x}	s	w	n	\bar{x}	s	w	n	\bar{x}	s	w	n	\bar{x}	s	w
Ylig Bay - Station N-1	No	Corals	Encountered										No	Corals	Encountered	
<u>Montipora verrilli</u>	1	12.0	-	-	1	6.0	-	-	1	12.0	-	-	1	14.0	-	-
<u>Pocillopora damicornis</u>	1	3.0	-	-	1	6.0	-	-	2	6.0	2.8	4-8	1	12.4	-	-
<u>Porites lutea</u>									3	8.0	4.0	4-12	1	6.0	-	-
TOTALS																3.0
Ylig Bay - Station N-2																
<u>Acanthastrea echinata</u>					4	23.3	4.6	18-29					1	14.0	-	-
<u>Acropora kentii</u>	1	7.7	-	-	1	31.0	-	-								
<u>Acropora (Corynbose sp. 2)</u>	1	12.0	-	-	2	15.9	8.3	10-21.8	3	8.4	4.0	6-13	1	12.4	-	-
<u>Echinophora lamellosa</u>	1	6.3	-	-	1	6.3	5.9	19-6-31	3	19.6	4.9	14-23	1	6.0	-	-
<u>Favia favus</u>					3	24.4	30.5	-								
<u>Favia pallida</u>					1	25.0	-	-	5	8.0	4.2	3-12.2	1	3.0	-	-
<u>Favia speciosa</u>																
<u>Goniastrea edwardsi</u>																
<u>Goniastrea retiformis</u>																
<u>Hydnophora microconos</u>																
<u>Lentastrea immersa</u>																
<u>Lentastrea purpurea</u>	4	13.6	3.2	9.8-16.9	1	13.0	-	-					1	56.7	-	-
<u>Leptoria phrygia</u>					1	15.0	-	-	1	95.3	-	-				
<u>Montipora hoffmeisteri</u>					1	31.5	-	-	1	95.5	-	-				
<u>Montipora lobulata</u>					1	14.1	-	-	1	29.9	-	-				
<u>Montipora patula</u>					1	41.0	-	-								
<u>Montipora verrilli</u>																
<u>Montipora (Tuberculate sp. 1)</u>																
<u>Montipora (Tuberculate sp. 2)</u>																
<u>Pavona divaricata</u>																
<u>Pocillopora damicornis</u>																
<u>Pocillopora danae</u>																
<u>Pocillopora eydouxi</u>																
<u>Pocillopora meandrina</u>																
<u>Pocillopora setchelli</u>																

Table 25. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR					
	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w
<i>Platygyra pini</i>	3	84.4	98.4	24.9-198	4	19.3	6.7	9.4-24.3	5	22.4	9.8	10-35	1	22.0	-	-	-	-	-	-	-	-	-	-
<i>Porites lutea</i>	13	30.5	51.4	3-198	29	20.4	9.4	2-41	31	17.2	22.4	2-95.5	9	19.0	15.5	3-56.7								
TOTALS																								
Ylig Bay - Station N-3																								
<i>Acanthastrea echinata</i>	1	15.8	-	-	1	15.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Acanthastrea hillae</i>	-	-	-	-	1	122.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Acropora hystrix</i>					1	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Acropora irregularis</i>					2	12.0	7.8	6.5-17.5																
<i>Acropora (Corymbose sp. 1)</i>	1	19.0	-	-	2	14.9	12.9	24-5.7																
<i>Acropora (Corymbose sp. 2)</i>																								
<i>Agariciella planulata</i>																								
<i>Alveopora (Explanata sp. 1)</i>																								
<i>Astreopora myriophthalma</i>																								
<i>Favia favus</i>	3	10.0	3.5	6-12	1	9.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia pallida</i>	1	5.5	-	-	1	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Favia speciosa</i>					3	7.4	2.6	5-10.2	3	17.1	12.1	6-30	1	7.7	-	-	-	-	-	-	-	-	-	-
<i>Favites flexuosa</i>					1	7.7	4.7	4-13	1	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Galaxea clavus</i>					1	23.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Goniastrea edwardsi</i>	3	23.8	15.3	6.9-36.7	3	13.1	3.0	10.6-16.5	1	12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Goniastrea retiformis</i>					6	9.7	5.8	4-18.8																
<i>Coniopora tenuidens</i>	1	16.0	-	-	1	44.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Coniopora columnaria</i>					1	11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Hydnophora microconos</i>	3	12.0	7.8	7-21	1	12.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptastrea purpurea</i>					1	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptastrea transversa</i>					1	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptoria phrygia</i>					1	35.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptoseris hawaiiensis</i>	1	12.0	-	-	1	42.2	31.3	20-64.3	9	18.9	14.3	1.7-43.5	1	6.7	-	-	-	-	-	-	-	-	-	-
<i>Millepora dichotoma</i>					2	49.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Millepora elschneri</i>					1	1.1	5.7	9.4-11	5.7	14.6	14.0	2.6-41.5	6	9.2	-	-	-	-	-	-	-	-	-	-
<i>Montipora hoffmeisteri</i>					1	11.5	5.7	4-19.9	6	19.0	15.5	3-56.7	1	9.2	-	-	-	-	-	-	-	-	-	-
<i>Montipora patula</i>																								
<i>Montipora sinensis</i>																								
<i>Montipora verrilli</i>																								
<i>Montipora verrucosa</i>																								

Table 25. continued

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	s	w	e	n	s	w	e	n	s	w	e	n	s	w	e
<i>Montipora</i> (Papillate sp. 1)					2	9.2	4.0	6.3-12	8	47.7	62.6	2.1-190				
<i>Montipora</i> (Tuberculate sp. 1)	1	164.9	-	-	1	200.0	-	-	1	11.7	8.7	4.2-20.5				
<i>Montipora</i> (Tuberculate sp. 2)					2	57.5	23.3	4.1-73.9	4	46.9	-	-				
<i>Pavona minutula</i>					3	125.5	151.2	37.4-300	1	120.0	-	-				
<i>Pavona</i> (<i>P.</i>) <u>obtusata</u>					3	125.5	151.2	37.4-300	1	10.2	-	-				
<i>Pavona</i> (<i>P.</i>) <u>venosa</u>					5	9.7	3.7	5-14.9	1							
<i>Pavona</i> (Encrusting sp. 1)					2	40.4	7.6	35-45.7								
<i>Pocillopora damicornis</i>	1	9.1	-	-												
<i>Pocillopora danae</i>	1	20.0	-	-												
<i>Pocillopora ligulata</i>	1	15.7	1.8	14.4-17	2	6.9	1.6	5.7-8								
<i>Pocillopora meandrina</i>	1	14.0	-	-	5	12.4	5.1	8-21								
<i>Pocillopora setchelli</i>	3	45.1	3.8	40.9-48.3	1	23.7	0	-		4	41.4	60.0	3-129.6			
<i>Porites lutea</i>	1	6.0	-	-	2	49.2	11.5	41-57.3	11	5.0	3.7	1.2-12.1				
<i>Porites superfusa</i>																
<i>Psammocora</i> (Encrusting sp. 1)					29	20.8	14.7	5.5-59	67	29.0	50.3	4-300	59	25.0	40.5	1.2-200
TOTALS													1	6.0	-	-
<i>Ylig Bay - Station N-4</i>																
<i>Acanthastrea echinata</i>						1	8.0	-	-							
<i>Acropora humilis</i>	1	11.2	-	-		1	5.0	-	-							
<i>Acropora irregularis</i>	1	30.5	-	-		1	11.0	-	-							
<i>Acropora nana</i>	1	8.9	-	-		1										
<i>Acropora wardii</i>	1	19.0	-	-		1										
<i>Acropora</i> (<i>Corymbose</i> sp. 1)	1	12.0	-	-		1										
<i>Acropora surculosa</i>	1	15.4	-	-		1										
<i>Alveopora</i> (<i>Explanare</i> sp. 1)																
<i>Cyphastrea</i> (Encrusting sp. 1)																
<i>Echinophyllia aspera</i>	1	7.0	-	-		2	11.0	4.2	8-14							
<i>Favia favus</i>	1	11.0	-	-	6-8					1	6.5-8	2	11.5	0.7	11-12	
<i>Favia matthai</i>	3	6.7	1.1			2	7.3	1.1		1	14.1	-	2	10.1	9.0	3.7-16.4
<i>Favia pallida</i>																
<i>Favia rotundata</i>	2	7.9	1.3	7-8.8	1	18.4	1			2	8.0	4.9	4.5-11.4	1	4.0	
<i>Favia russelli</i>	3	14.5	6.5	7-18.4	-											
<i>Favia speciosa</i>																
<i>Favia stelligera</i>	1	12.2	-	-												

Table 25. continued

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR							
	n	s	w	u	v	z	n	s	w	u	v	z	n	s	w	u	v	z	n	s	w	u	v	z		
<i>Pavites flexuosa</i>	1	18.1	-	-	-	-	1	13.3	-	-	-	-	2	17.5	10.7	9.9-25.1	-	-	-	-	-	-	-	-		
<i>Pavites virens</i>	1	11.0	-	-	-	-	1	12.1	-	-	-	-	1	23.5	-	-	-	-	-	-	-	-	-	-	-	
<i>Galaxea fascicularis</i>	1	8.2	-	-	-	-	1	53.0	-	-	-	-	1	15.0	-	-	-	-	-	-	-	-	-	-	-	
<i>Goniastrea edwardsi</i>	1	4.5	-	-	-	-	1	8.1	-	-	-	-	3	4.1	3.1	0.7-6.7	-	-	-	-	-	-	-	-	-	
<i>Goniastrea pectinata</i>	2	19.6	0.1	19.5-19.7	1	12.1	-	-	-	-	-	-	2	17.5	10.7	9.9-25.1	-	-	-	-	-	-	-	-	-	
<i>Goniastrea retiformis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Goniopora tenuidens</i>	1	12.0	-	-	-	-	1	53.0	-	-	-	-	1	23.5	-	-	-	-	-	-	-	-	-	-	-	-
<i>Leptastrea coerulea</i>	1	28.0	-	-	-	-	3	9.7	4.6	7-15	1	13.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptastrea microcosmos</i>	1	6.5	-	-	-	-	1	28.1	-	8.4-20	1	28.1	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptastrea purpurea</i>	1	8.1	-	-	-	-	1	24.0	-	-	1	14.2	8.2	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptastrea transversa</i>	1	6.5	-	-	-	-	1	6.5	-	-	1	14.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptoria phrygia</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptoseris myctoserooides</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Merulina ampliata</i>	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Millepora dichotoma</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Millepora platyphylla</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montastraea curta</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora elischneri</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora ehrenbergii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora hoffmeisteri</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora lobulata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora sinensis</i>	8	18.6	11.4	3.4-31.9	7	50.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora verrilli</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora verrucosa</i>	2	21.5	3.5	19-24	1	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora (Papillata) sp. 1)</i>	2	21.5	3.5	19-24	1	62.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Montipora (Glabrous sp. 1)</i>	1	10.6	-	-	-	-	1	77.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona minuta</i>	-	-	-	-	-	-	1	77.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona (P.) obtusata</i>	-	-	-	-	-	-	1	29.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pavona (P.) venosa</i>	1	8.1	-	-	-	-	1	41.0	-	-	-	-	3	13.6	8.3	8.7-23.2	-	-	-	-	-	-	-	-	-	
<i>Pavone (Foliaceous sp. 1)</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Platygyra daedalea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pterogyra sinuosa</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pocillopora damicornis</i>	1	6.0	-	-	-	-	1	4.0	-	-	-	-	1	27.0	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora danae</i>	2	11.5	12.0	3-20	1	27.0	-	-	-	-	-	-	1	107.0	71.6	53.1-179.6	4	160.1	179.5	5	8.6	6.7	6.7	6.7	6.7	6.7
<i>Pocillopora elegans</i>	1	41.0	-	-	-	-	1	97.0	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Pocillopora eydouxi</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

Table 25. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR						
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	
<i>Pocillopora ligulata</i>	1	29.3	-	-	4	17.7	9.5	9-31	1	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pocillopora meandrina</i>	3	7.7	6.4	4-15	1	8.9	-	-	1	21.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pocillopora setchelli</i>																									
<i>Pocillopora verrucosa</i>	1	28.0	-	-	1	12.8	-	-	1	10.0	3.1	6-12	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Pocillopora woodjonesi</i>	1	66.6	63.2	6.3-190	10	66.6	4.9	13	25.4	35.2	6-134.2	1	45.0	-	-	-	-	-	-	-	-	-	-	-	
<i>Pocillopora</i> (Ramos sp. 1)	1	9.0	4.5	4.9-19.4	8	10.2	4.5	3-6	3-6	1	27.1	49.0	8-94	1	7.9	-	-	-	-	-	-	-	-	-	
<i>Porites australiensis</i>																									
<i>Porites lobata</i>																									
<i>Porites lutea</i>																									
<i>Porites murraensis</i>	3	4.3	1.5	3-6																					
<i>Porites superfusa</i>																									
<i>Porites (S.) convexa</i>																									
<i>Porites (S.) horizontalata</i>																									
<i>Porites (S.) iwayamensis</i>																									
<i>Porites (S.) monticulosa</i>																									
<i>Porites (S.) vaughani</i>	1	7.0	-	-																					
<i>Psammocora contigua</i>																									
<i>Psammocora tiersstrassei</i>																									
<i>Psammocora (P.) haimeana</i>	1	32.0	-	-	1	4.0	-	-	1	60.5	27.6	41-80	1	58.4	-	-	1	5.7-5.9	1	6.0	-	-	-	-	
<i>Psammocora (Enrusting sp. 1)</i>																									
<i>Stylocoenella armata</i>																									
<i>Stryphophore mordax</i>																									
TOTALS	80	20.4	28.7	2.4-190	65	23.7	29.2	3.5-154.9	48	30.6	38.2	2-179.6	27	37.4	81.6	0.7-429									
Yili Bay - Station S-1																									
<i>Favia pallida</i>	1	8.0	-	-					1	9.0	-	-													
<i>Coniastrea retiformis</i>										1	49.8	-	-												
<i>Leptastrea transversa</i>										1	63.6	-	-												
<i>Montipora verrilli</i>										7	10.0	3.1	6-12	5	11.6	6.0	6-20								
<i>Pocillopora damicornis</i>										2	71.0	15.6	60-82	4	11.5	6.0	6-20								
<i>Porites lutea</i>										12	28.0	27.8	6-82	4	11.5	6.0	6-20								
TOTALS	1	8.0	-	-																					
No Corals Encountered																									

Table 25. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR						
	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	
Ylig Bay - Station S-2																									
<i>Acanthastrea echinata</i>				1	8.4	-													1	14.3	-				
<i>Acropora syringodes</i>				1	8.0	-													3	7.7	2.1				
<i>Acropora wardii</i>				1	6.0	-													-	-	-				
<i>Cyphastrea myriophthalma</i>																									
<i>Euphyllia</i> (Ramos sp. 1)																									
<i>Favia favus</i>																									
<i>Favia pallida</i>																									
<i>Favia speciosa</i>																									
<i>Goniastrea edwardsi</i>																									
<i>Goniastrea retiformis</i>																									
<i>Hydnophora microconos</i>																									
<i>Leptoria phrygia</i>																									
<i>Millepora foveolata</i>																									
<i>Montipora caliculata</i>																									
<i>Montipora elschneri</i>																									
<i>Montipora hofmeisteri</i>																									
<i>Montipora lobulata</i>																									
<i>Montipora tuberculosa</i>																									
<i>Montipora verrilli</i>																									
<i>Montipora verrucosa</i>																									
<i>Montipora</i> (Tuberculate sp. 1)																									
<i>Montipora</i> (Glabrous sp. 1)																									
<i>Montipora</i> (Papillate sp. 2)																									
<i>Montipora</i> (Tuberculate sp. 3)																									
<i>Pavona</i> (P.) <i>obtusa</i>																									
<i>Pavona</i> (P.) <i>venosa</i>																									
<i>Platygyra daedalea</i>																									
<i>Pocillopora damicornis</i>																									
<i>Pocillopora meandrina</i>																									
<i>Porites annae</i>																									
<i>Porites australiensis</i>																									
<i>Porites lobata</i>																									
<i>Porites lutea</i>																									
<i>Psammocora contigua</i>																									

Table 25. continued'

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR						
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	
<u>Psammocora</u> (Encrusting sp. 1)	4	7.1	7.9	2.5-19	1	141.0	-	-	1	24.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<u>Psammocora</u> (Ramoso sp. 1)	17	8.9	10.0	2-40	32	25.9	31.5	4-141	20	22.1	17.9	4-80.1	17.	4-80.1	17.	28.4	31.1	6-120	31.1	6-120	31.1	6-120	31.1	6-120	
TOTALS	17	8.9	10.0	2-40	32	25.9	31.5	4-141	20	22.1	17.9	4-80.1	17.	4-80.1	17.	28.4	31.1	6-120	31.1	6-120	31.1	6-120	31.1	6-120	
Ylig Bay - Station S-3																									
<u>Acanthastrea echinata</u>																									
<u>Acropora hystrix</u>																									
<u>Acropora irregularis</u>																									
<u>Acropora palmerae</u>																									
<u>Acropora surculosa</u>																									
<u>Acropora wardii</u>																									
<u>Alveopora</u> (<u>Explanate</u> sp. 1)																									
<u>Cyphastrea serailia</u>																									
<u>Favia favus</u>																									
<u>Favia matthai</u>																									
<u>Favia pallida</u>																									
<u>Favia russelli</u>																									
<u>Favia speciosa</u>																									
<u>Favia stelligera</u>																									
<u>Favites flexuosa</u>																									
<u>Galaxea fascicularis</u>																									
<u>Goniastrea edwardsi</u>																									
<u>Goniastrea retiformis</u>																									
<u>Hydnophora microcosmos</u>																									
<u>Leptastrea purpurea</u>																									
<u>Leptoria phrygia</u>																									
<u>Montastrea curta</u>																									
<u>Montipora hoffmeisteri</u>																									
<u>Montipora lobulata</u>																									
<u>Montipora patula</u>																									
<u>Montipora tuberculosa</u>																									
<u>Montipora verrilli</u>																									
<u>Montipora verrucosa</u>																									
<u>Montipora</u> (<u>Papillate</u> sp. 2)																									
<u>Montipora</u> (Tuberculate sp. 1)																									

Table 25. continued

	CHANNEL MARGIN						LOWER SLOPE						UPPER SLOPE						CHANNEL FLOOR						
	n	s	w	e	n	s	w	e	n	s	w	e	n	s	w	e	n	s	w	e	n	s	w	e	
Pavona varians					3	37.0	38.1	14-81																	
Pavona (P.) obtusata					3	46.7	47.8	11-101																	
Platygyra (P.) venosa					3	34.5	24.8	18.4-63																	
Pavona (P.) (Encrusting sp. 1)	1	8.0	-	-	1	26.5	-	-	1	6.0	-	-													
Platygyra Pani	1	2.0	-	-	2	3.7	2.9	2-7																	
Pocillopora damicornis					1	4.0	-	-																	
Pocillopora danae					1	37.8	-	-																	
Pocillopora eydouxii					1	10.0	-	-																	
Pocillopora meandrina					2	19.3	6.7	14.5-24																	
Pocillopora setchellii					8-20	1	6.4	-																	
Porites australiensis	2	14.0	8.5		3	54.0	68.7	-																	
Porites lobata					1	9.0	-	-																	
Porites lutea																									
Styloceniella armata																									
TOTALS	14	11.1	9.7		2-40	86	21.4	23.1	2-133	45	25.6	29.6	3.4-110.9												
Ylig Bay - Station S-4																									
Acanthastrea echinata									3	4.3	4.1	1-8.8													
Acropora humilis	1	18.0	-	-					2	9.6	3.4	7.2-12													
Acropora hystrix					1	14.1	-	-	3	5.3	0.6	4.9-6													
Acropora irregularis					1	9.7	4.6	7-15	1	8.8	-	-													
Acropora nana					3	7.0	-	-																	
Acropora nasuta					3	8.8	2.9	6.3-12	1	20.1	-	-													
Acropora palmerae					1	18.8	-	-	1	6.0	-	-													
Acropora surculosa					1	12.2	-	-																	
Acropora valida					1	6.0	-	-																	
Acropora wardii					1	14.0	-	-	1	15.0	-	-					3	14.4	9.9	4.9-24.7	5	19.2	14.2	5.1-35.1	
Acropora (Corymbose sp. 1)									1	6.7	-	-					1	1.5	0.7	1-2	-	-	-	-	
Acropora (Corymbose sp. 2)									1	41.0	-	-					1	11.0	-	-					
Alveopora (Explanate sp. 1)																	2	6-7	0.7	1	6.0	-	-	-	
Cyphastrea serialia																									
Diploastrea helioporia																									
Distichopora (sp. 1)	1	4.0	-	-					2	6.5	0.7														
Echinophyllia aspera																									
Favia favus																									
Favia marthai																									

Table 25. continued

	CHANNEL MARGIN						UPPER SLOPE						LOWER SLOPE						CHANNEL FLOOR						
	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	n	s	w	
<i>Favia pallida</i>	1	11.0	-	-	1	12.1	-	-	-	4-7.2	1	12.4	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Favia rotundata</i>					1	9.3	-	5.6	2.3	-	4-21	1	41.1	-	-	-	-	-	-	-	-	-	-	-	
<i>Favia russelli</i>					2	-																			
<i>Favia speciosa</i>																									
<i>Favia stelligera</i>	1	18.3	-	-	4	12.3	8.5	-	-	-	-														
<i>Favites abdita</i>																									
<i>Favites flexuosa</i>																									
<i>Goniastrea edwardsi</i>																									
<i>Goniastrea retiformis</i>	4	24.4	6.1	17.9-30	9	15.4	5.4	-	-	4.9-23.8	4-21	4	19.8	4.9	15.3-26.8										
<i>Goniopora tenuidens</i>																									
<i>Hydnophora microconos</i>	1	11.0	-	-	1	12.9	-	-	-	-	1	46.9	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptastrea purpurea</i>																									
<i>Leptastrea transversa</i>	5	22.3	8.9	11-31.7	2	5.0	0.1	4.9-5	15.3-21.5	1	9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	
<i>Leptoria phrygia</i>																									
<i>Leptoseris hawaiiensis</i>																									
<i>Leptoseris incrassans</i>																									
<i>Leptoseris (Explanate sp. 1)</i>																									
<i>Millepora dichotoma</i>																									
<i>Millepora foveolata</i>	1	62.0	-	-	2	69.0	39.6	-	-	41-97															
<i>Millepora platyphylla</i>	1	6.4	-	-	1	12.7	-	-	-	-															
<i>Montastraea curta</i>					1	101.0	-	-	-	-															
<i>Montipora Hoffmeisteri</i>																									
<i>Montipora lobulata</i>																									
<i>Montipora verrilli</i>																									
<i>Montipora verrucosa</i>																									
<i>Montipora (Papillate sp. 1)</i>																									
<i>Montipora (Papillate sp. 2)</i>																									
<i>Montipora (Tuberculate sp. 1)</i>																									
<i>Pavona varians</i>																									
<i>Pavona (P.) obtusata</i>	1	22.4	-	-	2	22.5	20.5	-	-	3.4-60.8	8	31.6	-	29.5	4.8-93.4										
<i>Pavona (P.) venosa</i>																									
<i>Pavona (P.) (Encrusting sp. 1)</i>																									
<i>Platygyra daedalea</i>																									
<i>Platygyra pini</i>																									
<i>Pocillopora brevicornis</i>																									
<i>Pocillopora damicornis</i>																									
<i>Pocillopora eydouxi</i>																									
<i>Montastraea curata</i>	1	6.4	-	-	1	44.2	-	-	12.7	-															

Table 25. continued'

	CHANNEL MARGIN				UPPER SLOPE				LOWER SLOPE				CHANNEL FLOOR			
	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w	n	\bar{Y}	s	w
Pocillopora meandrina	1	4.9	-	-	1	20.5	-	-	10	6.0	8.2	-	1	25.4	-	-
Pocillopora setchelli									3	6.0	2.0	4-8				
Porites australiensis																
Porites lobata																
Porites lutea																
Porites murrayensis																
Porites superfusa	11	3.5	1.4	-	2-5	3	2.7	1.2	2-4	3	6.3	2.1	4-8	-	-	-
Porites (S.) convexa						1	104.0	-	-	2	30.9	25.7	12.7-49	1	34.0	-
Porites (S.) horizontalata																
Porites (S.) iwayamaensis																
Porites (S.) vaughan	1	6.3	-	-	1	5.5	-	-	3	3.3	2.3	1.9-5.9	-	-	-	-
Psammocora niersraszzi																
Psammocora digitata																
Psammocora (Encrusting sp. 1)	1	62.0	-	-	1	81.0	-	-	3	3.3	2.3	1.9-5.9	-	-	-	-
Stylocoenella armata	1	4.0	-	-	1	40.6	-	-								
Styliophora mordax	1	8.7	-	-												
TOTALS	45	13.6	13.4	2-62	96	19.3	20.4	1-104	72	16.7	16.0	1-93.4	17	19.0	14.3	5.7-57.2

Table 26. Frequency distribution of coral colony diameters at Fouha Bay Stations N-1 through N-4 and S-1 through S-4.

SIZE RANGE (cm)	STATION N-1			STATION N-2			STATION N-3			STATION N-4			STATION S-1			STATION S-2			STATION S-3			STATION S-4			TOTAL												
	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor	Margin	Upper Slope	Lower Slope	Floor													
0 - 5	2	1	1	1	3	2	3	47	15	21	8	22	14	19	1	2	7	5	9	6	13	9	20	10	13	29											
5 - 10	1	1	1	1	1	3	5	4	25	16	11	55	23	24	8	10	9	8	23	26	13	1	30	27	14	13	286										
10 - 15									19	16	7	3	20	17	10		4	8	4	1	7	13	3	13	19	6	14	361									
15 - 20									10	13	4	3	8	10	9		6	3	6	1	11	5	9	5	3	109											
20 - 25									4	1	5	2	7	14	5		3	3	4	1	4	8	4	3	9	2	1										
25 - 30									1	3	1	8	1	3	12		1	6	1	1	3	3	4	3	3	2	1										
30 - 35									1	3	1	6	1	2	2		1	2	1	1	4	4	4	2	2	1	39										
35 - 40									1	3	1	3	3	2	1		10	1	1	1	4	4	4	1	3	2	1										
40 - 45									2	1	2	1	7	1	1		1	1	1	1	6	2	2	2	2	2	26										
45 - 50									4	1	5	2	5	1	5		1	2	1	1	1	1	1	1	1	1	1	18									
50 - 55									1	3	1	8	1	3	12		1	6	1	1	1	1	1	1	1	1	1	12									
55 - 60									1	1	1	3	1	2	2		8	2	1	1	4	4	4	1	1	1	1	17									
60 - 65									2	1	2	1	5	1	5		1	2	1	1	4	4	4	1	1	1	1	4									
65 - 70									1	2	1	2	2	2	3		1	2	1	1	1	1	1	1	1	1	1	13									
70 - 75									1	1	2	1	1	2	2		1	1	1	1	1	1	1	1	1	1	1	10									
75 - 80									2	1	1	1	1	2	1		1	1	1	1	1	1	1	1	1	1	1	6									
80 - 85									1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	5									
85 - 90									5	2	9	7	1	1	2		5	2	9	7	1	1	2	1	1	1	1	4									
90 - 95									2	9	7	1	1	2	5		1	1	1	1	2	1	1	1	1	1	1	15									
95 - 100									2	9	7	1	1	2	5		1	1	1	1	2	1	1	1	1	1	1	44									
Over 100									4	9	17	11	115	113	71	32	121	147	87	0	1	7	11	2	31	43	37	20	59	93	60	1	176	93	63	1	1330

Table 27. Frequency distribution of coral colony diameters at Ylig Bay Stations N-1 through N-4 and S-1 through S-4.

SIZE RANGE (cm)	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4			
	Margin	Slope	Lower	Upper																												
0 - 5					1	1	1	3	1	7	14	7	5	7	5	7	1	4	11	12	3	12	2	13	20	15	137					
5 - 10																																
10 - 15																																
15 - 20																																
20 - 25																																
25 - 30																																
30 - 35																																
35 - 40																																
40 - 45																																
45 - 50																																
50 - 55																																
55 - 60																																
60 - 65																																
65 - 70																																
70 - 75																																
75 - 80																																
80 - 85																																
85 - 90																																
90 - 95																																
95 - 100																																
Over 100																																
TOTAL	0	1	3	0	13	29	31	9	29	67	59	1	80	65	48	27	1	12	4	0	17	32	20	17	4	45	96	72	17			

Table 28. Frequency distribution of coral colony growth forms at Fouha Bay Stations N-1 through N-4 and S-1 through S-4.

COLONY FORM	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4				
	Marginal	Slope	Lower	Upper																													
Arborescent					6	7	3	2										1	1													20	
Cespitose					1	2	11	14	1	4	29	19	5	3	2	2		4	2	6	15	1	13	12	1					152			
Corymbose	4		1				8	9		29	10	1				1	4				5	4		4	3	34					117		
Massive		4	3	2	2	57	34	15	23	34	43	27	1	2	7	19	15	11	9	30	31	3	41	47	25	1				486			
Encrusting		4	8	6	30	23	7	4	19	40	38			1	6	14	10	8	9	27	17		12	20						303			
Columnar			2				11	23	6	6	16				3	3	4		5	6	23			6						114			
Explanate Plates			2				2	12	18	1	5				6	7	1	1	7	16	1		3	3						85			
Foliose		1		2		1										1															5		
Flabellate Plates				1	2			2																							9		
Free (Fungids)																															0		
Phaceloid				1		4	3		1	20							1	2	1			4	1							38			
Solitary							1																							1			
TOTAL	4	1	0	0	4	9	17	11	115	113	71	32	121	147	87	0	1	7	11	2	31	43	37	20	59	93	60	1	76	93	63	1	1330

Table 29. Frequency distribution of coral colony growth forms at Ylig Bay Stations N-1 through N-4 and S-1 through S-4.

COLONY FORM	STATION N-1				STATION N-2				STATION N-3				STATION N-4				STATION S-1				STATION S-2				STATION S-3				STATION S-4				
	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	Marginal	Upper Slope	Lower Slope	Floor	
Arborescent	1	1	4	1	4	1	1	4	1	4	1	1	3	3	3	3	1	4	2	23													
Cespitose	1	2	7	12	1	5	13	1	14	5	10	6	13	6	1	1	11		6	16	11	142											
Corymbose			1	4		1	2		7	2	1		1		1		1	2		6	4	32											
Massive	2	4	11	12	4	10	23	11	1	36	24	6	4	1	4	4	4	11	12	8	5	28	20	10	28	13	3	299					
Encrusting	1	4	6	7	3	11	24	36	16	23	17	13	2				14	6	7	1	21	23	22	26	28	6	317						
Columnar									1				4	3						1	3		2	1	1	16							
Explanate Plates		1	1			1	9		5	4	10									6	2		14	16	7	76							
Foliose						1				1	2											1	1	1	6								
Flabellate Plates										1	1											1		1	3								
Free (Eugnathiids)																					0												
Phaceloid										1	1	4								1	4	15				26							
TOTAL	0	1	3	0	13	29	31	9	29	67	59	1	80	65	48	27	1	12	4	0	17	32	20	17	14	86	45	0	45	96	72	17	940

Discussion

As we moved along the river channel in the bay from the river mouth towards the open sea, there was a marked decrease in suspended sediment load and there was a marked increase in the complexity of the coral community. There was a six-fold (south side of the bay) to thirty-four-fold (north side of the bay) decrease in suspended sediment load between the first and fourth stations in Fouha Bay and a four-fold (north) to nine-fold (south) decrease in suspended sediment load between the first and fourth stations in Ylig Bay (Table 20). As we moved out of Fouha Bay to the fifth station, the suspended sediment load began to increase again (Table 20). This was possibly because heavier wave action on the open coast kept more materials in suspension.

As the suspended sediment load generally decreased along the shore-to-seaward gradient, the complexity of the coral community and the prevalence of corals generally increased. Between the first and fourth stations in both Fouha Bay and Ylig Bay, the numbers of coral species increased from less than ten to over one hundred (Table 21), the number of genera of corals increased from less than ten to thirty-five or over (Table 21), and the percent of the solid substrate occupied by corals increased from less than 2% to over 12% (Tables 22 and 23).

If the average suspended sediment load for 4.4 cm^2 over 6-week periods was in the range of 30 to 40 gms dry weight, then we would expect a depauperate coral community of less than 10 species covering less than 2% of the solid substrate to persist. If the average suspended sediment load was in the range of one to 6 gms dry weight, then we would expect a rich coral community of over 100 species covering over 12% of the solid substrate to develop. Suspended sediment loads with ranges between the above ranges would produce coral communities with intermediate species richness of corals and proportions of solid substrata occupied by corals.

Suspended sediment load is one of many factors that influence the structures of the coral communities in Fouha Bay and Ylig Bay. Water temperature, pH, salinity, nitrate content and phosphate content may influence the structures of coral communities on a larger scale of reference, but with the scope of this study in the two bays, these factors varied with time to such a large extent that the differences in magnitude of these factors between stations was generally negligible or confused..

When comparing the size distributions of the coral populations at the different stations, we find the third stations to have the most evenly proportioned size distributions (Tables 26 and 27). This suggests that recruitment and mortality may be relatively regular and therefore the populations of corals may be relatively stable at the third stations. At the other stations, there are relatively more corals in the small size classes and relatively few in the large size classes. This suggests that even if recruitment is greater, the mortality is also greater. Even the

fourth stations appear to have a higher rate of turnover in the coral populations than do the third stations. The relative evenness of distribution into size classes in the third stations suggests that both recruitment and mortality are relatively less sporadic than at other stations.

A similar examination of size distribution of the coral populations between the margins, the upper slopes, the lower slopes and the floors reveals that the coral populations on the slopes have the most even age distributions (Tables 26 and 27). The upper slope populations appear to have relatively steady recruitment with the greatest survival of juveniles to adulthood and old age. The lower slope populations are also relatively stable, but there appears to be more turnover, i.e., there is relatively more recruitment and fewer corals in the larger size classes on the lower slope than on the upper slope. The populations on the reef margin appear to have a lot of recruitment, but also high mortality. The coral populations on the channel floor are very depauperate because of very low success of recruitment. This is probably mainly because of the accumulation of sediments on the channel floor which usually bury and smother settling planulae and juvenile corals.

References Cited

- Maragos, J. E. 1972. A study of the ecology of Hawaiian reef corals. Univ. Hawaii, Ph.D. dissertation in Zoology.
- Strickland, J. D. H., and T. R. Parsons. 1968. A practical handbook of seawater analysis. Fisheries Res. Bd. Canada Bull. 167:1-311.
- U. S. Geological Survey Water Supply Paper. 1971. Surface water supply of the United States, Part 16. Hawaii and other Pacific Areas. Geological Water Supply Paper No. 1937. 710 p.
- Van Eepoel, R. P., and D. I. Grigg. 1970. Survey of the ecology and water quality of Lindberg Bay, St. Thomas. Caribb. Res. Inst. Water Pollut. Rept. 4. 6 p.

NOAA COASTAL SERVICES CENTER LIBRARY



3 6668 14109 7313